April 26, 2021

# Traffic Impact Study

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Prepared for

Louisville Metro Planning Commission





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#### INTRODUCTION

The site plan for the proposed subdivision shows 119 single-family lots and 30 multi-family units on Old Heady Road in Louisville, KY. **Figure 1** displays a map of the site. Access from Old Heady Road to the site will be from an entrance opposite Chenoweth Run Road. The subdivision also connects to Saratoga Springs at Saddle Bend Way. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersection of Old Heady Road with Chenoweth Run Road.

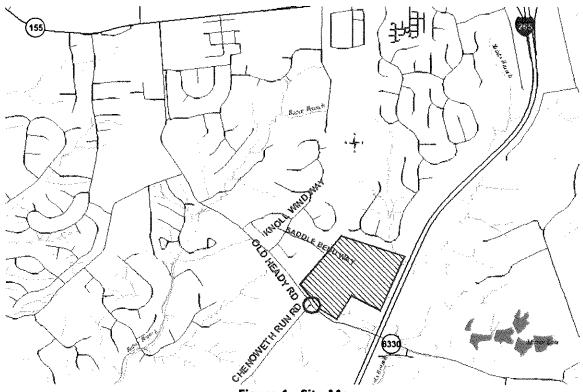


Figure 1. Site Map

#### **EXISTING CONDITIONS**

Old Heady Road is a maintained by Louisville Metro with an estimated 2021 ADT of 900 vehicles per day south of Knoll Wind Way, as estimated from the turning movement count. The road is a two-lane highway with ten-foot lanes with three-foot stabilized shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Chenoweth Run Road is controlled with a stop sign.

Peak hour traffic count for the intersections was obtained on Tuesday, April 13, 2021. The a.m. peak hour occurred between 8:00 to 9:00 a.m. and the p.m. peak hour occurred between 5:00 and 6:00. Figure 2 illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.

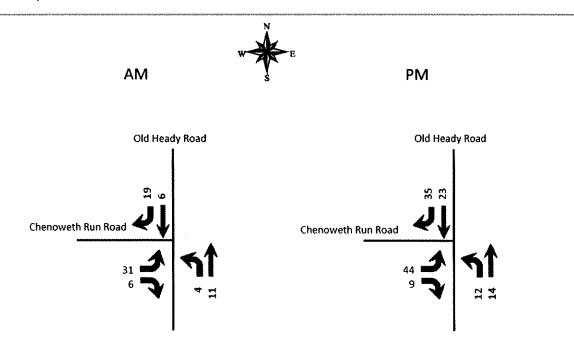


Figure 2. Existing Peak Hour Volumes

## **FUTURE CONDITIONS**

The project completion date is 2025. An annual growth rate of 2 percent was applied to the 2021 volumes. **Figure 3** displays the 2025 No Build peak hour volumes.

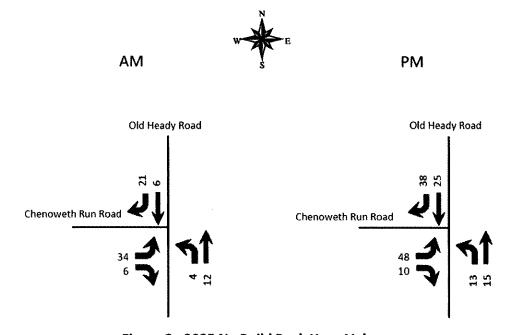


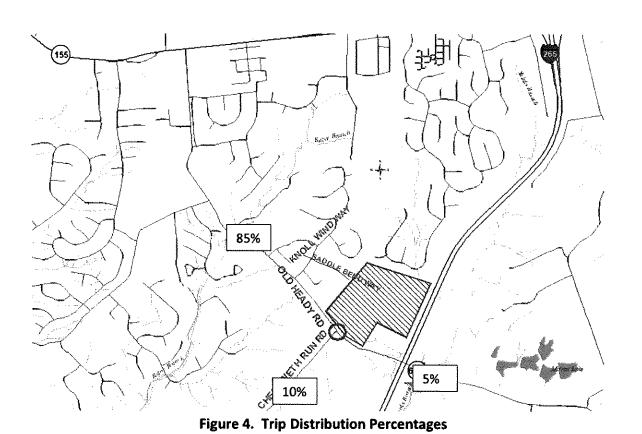
Figure 3. 2025 No Build Peak Hour Volumes

#### **TRIP GENERATION**

The Institute of Transportation Engineers <u>Trip Generation Manual</u>, 10<sup>th</sup> Edition contains trip generation rates for a wide range of developments. The land use of "Single-Family Detached (210)" was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed.

|                           | A.M.  | Peak | Hour | P.M. F | Peak | Hour |
|---------------------------|-------|------|------|--------|------|------|
| Land Use                  | Trips | In   | Out  | Trips  | ln   | Out  |
| Single-Family (119 units) | 89    | 22   | 67   | 120    | 76   | 44   |
| Multi-Family (30 units)   | 15    | 3    | 12   | 20     | 13   | 7    |
| TOTAL                     | 104   | 25   | 79   | 140    | 89   | 51   |

Table 1. Peak Hour Trips Generated by Site



Diane B. Zimmerman Traffic Engineering, LLC.

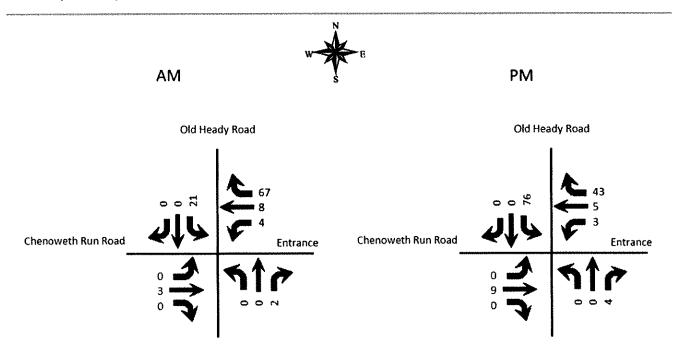


Figure 5. Peak Hour Trips Generated by Site

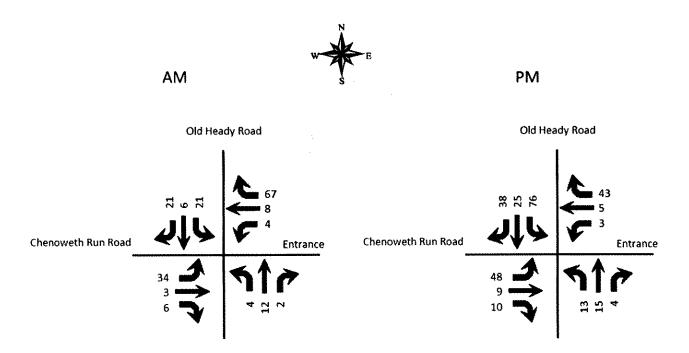


Figure 6. 2025 Build Peak Hour Volumes

#### **ANALYSIS**

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service". Level of Service is a ranking scale from A through F, "A" is the best operating condition and "F" is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced for lanes at stop-controlled intersections.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the <u>Highway Capacity Manual</u>, 6<sup>th</sup> edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9) software. The delays and Level of Service are summarized in **Table 2**.

**Table 2. Peak Hour Level of Service** 

|                                      |                  | A.M.             |       |   | P.M.     |       |
|--------------------------------------|------------------|------------------|-------|---|----------|-------|
| Approach                             | 2021<br>Existing | 2025<br>No Build | 2025  | 2020                                    | 2025     | 2025  |
| Old Heady Road at Chenoweth Run Road | Existing         | NO BUIR          | Build | Existing                                | No Build | Build |
| Chenoweth Run Road Eastbound         | Α                | Α                | В     | Α                                       | Α        | В     |
| Onenoweth Null Nodu Eastboulla       | 9.0              | 9.1              | 10.9  | 9.4                                     | 9.5      | 12.8  |
| Entrance Westbound                   |                  |                  | Α     |   |          | Α     |
| Little and a vestpound               |                  |                  | 9.2   | *************************************** |          | 9.3   |
| Old Heady Road Northbound (left)     | Α                | Α                | Α     | Α                                       | Α        | Α     |
| Old Fleady Road Northbodild (left)   | 7.3              | 7.3              | 7.3   | 7.4                                     | 7.4      | 7.4   |
| Old Heady Road Southbound (left)     |                  |                  | Α     |   |          | Α     |
| Old Fleady Noad Southboulid (left)   |                  |                  | 7.3   |   |          | 7.4   |

Key: Level of Service, Delay in seconds per vehicle

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet <u>Highway Design Guidance</u> <u>Manual</u> dated July, 2020. Using the volumes in Figure 6, a southbound left-turn lane will not be required at the entrance.

#### **CONCLUSIONS**

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2025, there will be a slight impact to the existing highway network. A left-turn lane will not be required at the entrance. No other improvements are required.

# **APPENDIX**

#### **Traffic Counts**

#### Classified Turn Movement Count | | All vehicles

Marr Traffic DATA COLLECTION

www.marrtraffic.com

Site 2 of 2 Old Heady Rd (South) Weather Tuesday, April 13, 2021 Claudy

Old Heady Rd (North) 61°F Eat/Long 38.169725", -85.524743" Chenoweth Run Rd

0700 - 0900 (Weekday 2h Session) (13-04-2021)

All vehicles

Old Heady Road, KY

|                |       | Norti    | bound        | <i>2016</i> (2) | inimierov i A <b>so</b> | uthbou                                  | ind     | V-5-5-5 | <u> </u> | Eastbour    |        | <u> </u> |
|----------------|-------|----------|--------------|-----------------|-------------------------|---|---------|---------|----------|-------------|--------|----------|
|                |       | Old Head | y Rd (South) |                 | Old He                  | ady Rd                                  | (North) |         |          | henoweth R  | un Rd  |          |
|                | Left  | Thru     | U-Turn       | App             | Thru                    | 7000 0000000000000000000000000000000000 | U-Turn  | App     | Left     | 100 T wheel | U-Turn | App      |
| TIME           | 2.1   | 2.2      | 2.3          | Total           | 2.4                     | 2.5                                     | 2.6     | Total   | 2.7      | 2.8         | 2.9    | Total    |
| 0700 - 0715    | 0     | 1        | 0            | 1               | 0                       | 5                                       | 0       | 5       | 1        | 4           | 0      | 5        |
| 0715 - 0730    | 0     | 2        | 0            | 2               | 0                       | 10                                      | 0       | 10      | 5        | 1           | 0      | 6        |
| 0730 - 0745    | 0     | 1        | 0            | 1               | 0                       | 7                                       | 0       | 7       | 4        | 1           | 0      | 5        |
| 0745 - 0800    | 0     | 2        | 0            | 2               | 1                       | 1                                       | 0       | 2       | 3        | 0           | 0      | 3        |
| Hourly Total   | 0     | 6        | 0            | - 6             | 1                       | 23                                      | 0       | 24      | 13       | 6           | 0      | 19       |
| 0800 - 0815    | 2     | 2        | 0            | 4               | 0                       | 9                                       | 0       | 9       | 19       | 2           | 0      | 21       |
| 0815 - 0830    | 1     | 3        | 0            | 4               | 2                       | 3                                       | 0       | 3       | 7        | 1           | 0      | 8        |
| 0830 - 0845    | 0     | 2        | 0            | 2               | 1                       | 2                                       | 0       | 3       | 3        | 2           | 0      | 5        |
| 0845 + 0900    | 1     | 4        | 0            | 5               | 3                       | 5                                       | 0       | 8       | 2        | 1           | 0      | 3        |
| Hourly Total   | 4     | 13       | 0            | 15              | 6                       | 19                                      | 0       | 25      | 31       | 6           | 0      | 37       |
| Grand Total    | 4     | 17       | 0            | 21              | 7                       | 42                                      | D       | 49      | 44       | 12          | 0      | 56       |
| Approach %     | 19.05 | 80.95    | 0.00         | -               | 14.29                   | 85.71                                   | 0.00    | •       | 78.57    | 21.43       | 0.00   | -        |
| intersection % | 3.17  | 13.49    | 0.00         | 16.67           | 5.56                    | 33.33                                   | 0.00    | 38.89   | 34.92    | 9.52        | 0.00   | 44.4     |
| PHF            | 0.50  | 0.69     | 0.00         | 0.75            | 0.50                    | 0.53                                    | 0.00    | 0.69    | 0.41     | 0.75        | 0.00   | 0.44     |
|                |       |          |              |                 |                         |   |         |         |          |             |        |          |

0.57

1600 - 1800 (Weekday 2h Session) (13-04-2021) All vehicles

|                |       | North    | bound      |          | 50     | uthbou   | nd     |       |       | Lastbour   | id     |       |
|----------------|-------|----------|------------|----------|--------|----------|--------|-------|-------|------------|--------|-------|
|                |       | Old Head | Rd (South) |          | Old He | ady Rd ( | North) |       | С     | henoweth R | un Rd  |       |
|                | Left  | Thru     | U-Turn     | App      | Thru   | Right    | U-Turn | App   | Left  |            | U-Turn | App   |
| TIME           | 2.1   | 2.2      | 2.3        | Total    | 2.4    | 2.5      | 2.6    | Total | 2.7   | 2.8        | 2.9    | Total |
| 1600 - 1615    | 3     | 7        | 0          | 10       | 9      | 9        | 0      | 18    | 8     | 2          | 0      | 10    |
| 1615 - 1630    | 2     | 2        | 0          | 4        | 4      | 10       | 0      | 14    | 12    | 1          | 0      | 13    |
| 1630 - 1645    | 6     | 2        | 0          | 8        | 7      | 9        | 0      | 16    | 20    | 4          | 0      | 24    |
| 1645 - 1700    | 1     | 3        | 0          | <b>4</b> | 3      | 7        | 0      | 10    | 4     | 2          | 0      | - 6   |
| Hourly Total   | 12    | 14       | 0          | 25       | 23     | 35       | 0      | 58    | 44    | 9          | 0      | 53    |
| 1700 - 1715    | 4     | 3        | 0          | 7        | 6      | 7        | 0      | 13    | 4     | 1          | 0      | 5     |
| 1715 - 1730    | 5     | 5        | 0          | 10       | 6      | 6        | 0      | 12    | 6     | 2          | 0      | 8     |
| 1730 - 1745    | 1     | 3        | 0          | 4        | 3      | 5        | 0      | 8     | 3     | 3          | 0      | - 6   |
| 1745 - 1800    | 2     | 3        | 0          | 5        | 7      | ì        | 0      | 8     | 4     | 3          | 0      | 7     |
| Hourly Total   | 12    | 14       | 0          | 26       | 22     | 19       | 0      | 41    | 17    | 9          | 0      | 26    |
| Grand Total    | 24    | 28       | Ō          | 52       | 45     | 54       | 0      | 99    | 61    | 18         | 0      | 79    |
| Approach %     | 46.15 | 53.85    | 0.00       | -        | 45.45  | 54.55    | 0.00   | •     | 77.22 | 22.78      | 0.00   | -     |
| Intersection % | 10.43 | 12.17    | 0.00       | 22.61    | 19.57  | 23.48    | 0.00   | 43.04 | 26.52 | 7.83       | 0.00   | 34.35 |
| PHF            | 0.50  | 0.50     | 0.00       | 0.65     | 0.64   | 88.0     | 0.00   | 0.81  | 0.55  | 0.56       | 0.00   | 0.55  |

0.71

## **HCS Reports**

|  |  | H   | CS7  | Two-                                    | Way              | Sto                                     | o-Co         | ntrol    | Rep                                     | ort  |   |  |                            |   |                      |  |
|--|--|---|--|---|------------------|---|--------------|----------|---|--|---|--|----------------------------|---|----------------------|--|
| General Information  |  |   |  |   |                  | en en en en en                          | Site         | Infort   | natio                                   | 1  |   |  |                            |   |                      |  |
| Analyst  | DBZ  |   |  |   |                  |   | Inters       | ection   |   | ****   | Old F                                   | leady at   | Chenow                     | eth Ru                                  | ·P050000             |  |
| Agency/Co.   | 4  | 8 Zimm  | erman '  | Traffic En                              | aineerin         | a a                                     |              | liction  | 000000000000000000000000000000000000000 |  | Carrier to                              | versu est  |                            | Silvitais/aice.                         | 100000000            | 550100   |
| Date Performed   | 4/27/  |   |  | *************************************** |                  | ************                            |              | West Str | <del>omorono.</del><br>eet              | ONN) PRINCIPAL P | Chen                                    | oweth R  | un Road                    |   |                      |  |
| Analysis Year  | 2021   |   |  |   | 81/88/68         | NEESS (SS)                              |              | y/South  |   | W.SS. 839.   | -                                       | leady Ro   |                            |   |                      | W. O.  |
| Time Analyzed  | AM Po  | eak   | an almony very                                 | ******                                  |                  |   |              | Hour Fa  | 22200000000000000000000000000000000000  | - CANADA MARIE AND   | 0.57                                    |  | <del>03.030.030.0303</del> | *************************************** | 73.00 MATERIAL STATE | 1000000  |
| Intersection Orientation   | and the same of th | -South  |  |   |                  |   | Analy        | sis Time | Period (                                | hrs)   | 0.25                                    |  | ///www.                    |   |                      |  |
| Project Description  | Old H  |   |  | ····                                    |                  | ·                                       | L            |          |   | en in Terresia.<br>Marie de Marie de M<br>Marie de Marie de Ma   |   | economical de la conomica del conomica del conomica de la conomica del la conomica de la conomic | онноши <u>лизман</u> они   | <del>ood was en voord</del>             | -cissaanibanaanib    |  |
| Lanes  |  |   |  | 100000000000000000000000000000000000000 |                  | 1100110010                              | odovinsky na |          | 000000000000000000000000000000000000000 |  | 70E-925-15                              | 0 (30)   |                            |   | (1565)               | e de la composición dela composición de la composición dela composición de la compos |
|  | **********   | *********   |  |   |                  |   |              | *****    | ·                                       |  |   | ****   | **************             | ***                                     | ************         |  |
|  |  |   |  |   | O A Mayo         | i<br>Net Vo                             | 1 2 di       |          |   | ashty a coal in all  | MANAGERIA (MARAGERIA DA ANTARA)         |  |                            | Olle III                                |                      |  |
| Vehicle Volumes and Adj  | ustme  | nts   |  |   |                  |   |              |          | \$0.000 B                               | 100  | (50,000)                                |  |                            |   |                      |  |
|  | <del></del>  |   | ***************************************        | NOVEMBER OF STREET                      | ganicanio uniona | 147                                     |              |          |   |  |   |  | 1                          | C. 4                                    | 4                    | MODERAL PROPERTY.  |
| Approach   | Ţ <u></u>  | ***************************************               | ound   |   |                  | *************************************** | bound        |          |   | ***************************************  | bound                                   | T o  |                            | -                                       | bound                | ***************************************  |
| Approach Movement  | U  | L   | τ  | R                                       | Ü                | L                                       | ĮŢ           | R        | U                                       | L  | T                                       | I R  | Ü                          | L                                       | T                    | I R  |
| Approach Movement Priority   | U  | L<br>10   | 1<br>11  | 12                                      | Ü                | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>1   | T 2                                     | 3  | 4U                         | L<br>4                                  | T<br>5               | 6  |
| Approach Movement Priority Number of Lanes   | U  | L   | 11<br>1  |   | U                | L                                       | ĮŢ           | <b>*</b> | ·                                       | 1<br>0   | T                                       | <b></b>  |                            | L                                       | T                    | 6  |
| Approach Movement Priority Number of Lanes Configuration   | U  | 10<br>0   | 1<br>11  | 12<br>0                                 | U                | 1.<br>7                                 | 8            | 9        | 10                                      | I<br>I<br>O  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h)  |  | 10<br>0<br>31   | 11<br>1  | 12<br>0<br>6                            | U                | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>0<br>LT<br>4  | T 2                                     | 3  | 4U                         | L<br>4                                  | T<br>5               | 16   |
| Approach  Movement  Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)   |  | 10<br>0   | 11<br>1  | 12<br>0                                 | Ü                | 1.<br>7                                 | 8            | 9        | 10                                      | I<br>I<br>O  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach Movement Priority Number of Lanes Configuration Volume (vefi/h) Percent Heavy Vehicles (%) Proportion Time Blocked  | U  | 10<br>0<br>31<br>3                                    | 11<br>1<br>1<br>LR                             | 12<br>0<br>6                            | U                | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>0<br>LT<br>4  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach  Movement  Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)   |  | 10<br>0<br>31<br>3                                    | 11<br>1  | 12<br>0<br>6                            | U                | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>0<br>LT<br>4  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | 7<br>7   |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized  |  | 10<br>0<br>31<br>3                                    | 11<br>1<br>1<br>LR                             | 12<br>0<br>6<br>0                       |                  | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>0<br>LT<br>4  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach  Movement  Priority  Number of Lanes  Configuration  Volume (veft/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage   |  | 10<br>0<br>31<br>3                                    | 11<br>1<br>1<br>LR                             | 12<br>0<br>6<br>0                       | U                | 1.<br>7                                 | 8            | 9        | 10                                      | L<br>0<br>LT<br>4  | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He  |  | 10<br>0<br>31<br>3                                    | 11<br>1<br>1<br>LR                             | 12<br>0<br>6<br>0                       |                  | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0   | 2<br>1                                  | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec)   |  | 31<br>3<br>3<br>7.1                                   | 11 1 LR  | 12 0 0 6 0 Undi                         | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0   | 1 11 11 11 11 11 11 11 11 11 11 11 11 1 | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
| Approach  Movement  Priority  Number of Lanes  Configuration  Volume (vefy/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up He  Base Critical Headway (sec)   |  | 31<br>3<br>3<br>7.1<br>6.43                           | 11 1 LR  | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0 0   | 1 11 11 11 11 11 11 11 11 11 11 11 11 1 | 3  | 4U                         | L<br>4                                  | 5<br>1               | 7<br>7   |
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| Approach Movement Priority Number of Lanes Configuration Volume (vefy/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)  | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 LR  | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0 0   | 1 11 11 11 11 11 11 11 11 11 11 11 11 1 | 3  | 4U                         | L<br>4                                  | 5<br>1               | ( )  |
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| Approach Movement Priority Number of Lanes Configuration Volume (vefv/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)  | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 LR  | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0 0   | 1 11 11 11 11 11 11 11 11 11 11 11 11 1 | 3  | 4U                         | L<br>4                                  | 5<br>1               | 7<br>7   |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Follow-Up Headway (sec)   | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | T<br>11<br>1<br>LR                             | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L1 4 0 0 4.1 4.10 2.2 2.20   | 11                                      | 3  | 4U                         | L<br>4                                  | 5<br>1               | Ţ  |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)  Pollay, Queue Length, an Flow Rate, v (veh/h)  | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | T<br>11<br>LR<br>0<br>0                        | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | L 1 0 LT 4 0 0 LT 4.10 2.2 2.20 7  | 11                                      | 3  | 4U                         | L<br>4                                  | 5<br>1               | Ţ  |
| Approach Movement Priority Number of Lanes Configuration Volume (vefv/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Pollow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h)   | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 LR 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | 1 0 LT 4 0 0 LT 4.10 4.10 2.2 2.20 7 1578  | 11                                      | 3  | 4U                         | L<br>4                                  | 5<br>1               | 7<br>7   |
| Approach Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Follow-Up Headway (sec) Follow-Up Headway (sec) Polloy-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio              | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 LR 00 00 00 00 00 00 00 00 00 00 00 00 00 | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | 4.10<br>2.22<br>2.20<br>7<br>1578<br>0.00  | 11                                      | 3  | 4U                         | L<br>4                                  | 5<br>1               | Ţ  |
| Approach  Movement  Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up H  Base Critical Headway (sec)  Critical Headway (sec)  Base Follow-Up Headway (sec)  Follow-Up Headway (sec)  Pollow-Up Headway (sec)  Delay, Queue Length, an  Flow Rate, v (veh/h)  Capacity, c (veh/h)  v/c Ratio  95% Queue Length, Q <sub>99</sub> (veh) | eadwa  | 10<br>0<br>31<br>3<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 LR 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   | 12<br>0<br>6<br>0<br>Undi               | vided            | 1.<br>7                                 | 8            | 9        | 10                                      | 4.1<br>4.10<br>2.2<br>2.20<br>7<br>1578<br>0.00  | 11                                      | 3  | 4U                         | L<br>4                                  | 5<br>1               | T  |

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|   |   | H                    | CS7                         | Two                | -Way   | Sto  | o-Co                                    | ntrol                                   | Rep          | ort                     |  |   |   |  |  |  |
|---|---|----------------------|-----------------------------|--------------------|--|--|---|---|--------------|-------------------------|--|---|---|--|--|--|
| General Information                           |   |                      |                             |                    |  |  | Site                                    | Inforn                                  | natio        | 1                       |  |   |   |  | (Incress)                              |  |
| Analyst                                       | DBZ   |                      | AND THE PERSON NAMED IN     |                    |  | ······································   | Inters                                  | ection                                  |              | ///intelethmonecous     | Old F  | leady at                                | Chenov                                  | veth Ru  |  |  |
| Agency/Co.                                    | Diane   | B Zimm               | erman T                     | raffic En          | gineerin   | 9  | Jurisd                                  | iction                                  |              |                         |  |   |   |  |  |  |
| Date Performed                                | 4/27/   | 2021                 | Marie Latin College College |                    |  | *****  | East/                                   | West Stre                               | et           | Western Commence States | Chen   | oweth R                                 | un Roac                                 | **************************************   | <del>POMOSIONI/PIOSON</del>            | OKOGEM HARIANIA  |
| Analysis Year                                 | 2025  |                      | 8                           |                    |  |  | North                                   | y/South S                               | Street       |                         | 0101   | leady Ro                                | ad                                      | ***************************************  |  |  |
| Time Analyzed                                 | AM P  | eak No f             | Build                       | MATATINENTHOCOGNO  | TOTAL STATE OF THE PARTY OF THE | HUZAGAN HIIRANA  | Peak                                    | Hour Fac                                | tor          |                         | 0.57   |   |   | Willia Commission D  | om=6t=6-mt#/dov/s-s-u                  |  |
| Intersection Orientation                      | North   | r-South              |                             | OXVENIA VICENA     | HE ETWO CONTROL  | ACCOUNT OF THE PARTY OF THE PAR | Analy                                   | sis Time                                | Period (     | hrs)                    | 0.25   |   |   | 15 (S (  |  |  |
| Project Description                           | Old H   | leady                | DANGES MARKET CONTROL       | MSCHIMING PENERSKI |  |  | *************************************** |   |              | Alexanio medico con     |  | **********                              |   | dimentințoja injon   |  | - Constant   |
| Lanes   |   |                      |                             |                    |  |  |   |   |              |                         |  |   |   |  |  |  |
|   |   |                      |                             |                    | Majo   | *I   | th-South                                |   |              |                         |  |   |   | Military many says and says a |  | NOTEEN ALVONOUS (A   |
| Vehicle Volumes and Adju                      | istme   | ****                 |                             | errore de secondo  | <del></del>  |  | and the second                          |   |              |                         |  |   | _                                       |  |  |  |
| Approach                                      |   | g-Vanishin bereitung | ound                        | ganonaanaan        | ļ  | ***************************************  | bound                                   | Service contracts                       |              |                         | bound  |   | ļ                                       | South  | bound                                  | dinimi minimi  |
| Movement                                      | U   | @Las                 | J                           | R                  | U  | <u>L</u>   | 1 5                                     | R                                       | ્રા          | i L                     | J  | R                                       | U                                       | . <b>L</b> .   | <u> </u>                               | R  |
| Priority                                      | 5144276556  | 10                   | 11                          | 12                 | 0.0000000000000000000000000000000000000  | 7  | 8                                       | 9                                       | 10           | 1                       | 2  | 3                                       | 40                                      | 4  | 5                                      | 6  |
| Number of Lanes                               | ***************************************   | 0                    | 1                           | 0                  |  | 0  | 0                                       | 0                                       | 0            | 0                       | 1  | 0                                       | 0                                       | 0  | A61 50                                 | 0  |
| Configuration                                 | 2500000000  |                      | LR                          | 8582558            |  | 15-FA162010  | 92557463                                | 100000000000000000000000000000000000000 |              | LT                      |  |   | 18020000                                | 200895000  | <u> </u>                               | TR   |
| Volume (yeh/h)                                | CANAL PROPERTY OF THE PARTY OF | 34                   |                             | 6                  | ļ  |  |   |   |              | 4                       | 12   |   |   |  | 6                                      | 21   |
| Percent Heavy Vehicles (%)                    |   | 3                    |                             | 0                  |  | <b></b>  | <b>_</b>                                |   |              | 0                       | <b>_</b>   |   |   |  |  |  |
| Proportion Time Blocked  Percent Grade (%)    | 300000000   | 1984830              | 0                           | 2001220            |  |  | 400000000                               |   |              |                         |  | 1                                       | <b>!</b>                                | <u> </u>   |  | <u> </u>   |
| ***************************************       | ceanterescopice   |                      | U                           | NACONAL PROPERTY.  |  | 3021336E4104   | neminera mena                           | CATACONTINO CANTO                       |              |                         | Maria de la composição de   | OKA ZINISZAUKU                          | ļ                                       | <b>Фанализания</b>   | XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX | <del></del>  |
| Right Turn Channelized  Median Type   Storage | 20/2020030  | V. (3.2.1(6.2))      | 9805555                     | lind               | vided  | 11000000000  | 200 ASSA (ASSA                          |   |              |                         | es (50.128)  | M883 ASS NO.                            | 1 4698                                  | ¥88788500  | \$01551/35X                            |  |
| Critical and Follow-up He                     | adwa  | VS                   |                             | UNU                | TIUCU  |  |   |   | L            |                         | Tarayan, waxan qoo ay  | *************************************** | *************************************** | TAMES EARCHINGS  |  | Maria Ma |
| Base Critical Headway (sec)                   |   | 7.1                  | T                           | Ter                | T  | <b>1</b>   | r -                                     |   | Ī            |                         | T  |   | I                                       | 1  | T                                      | T  |
| Critical Headway (sec)                        |   | 6.43                 | <b> </b>                    | 6.2<br>6.20        | <b> </b>   | woman war in so  | <b></b>                                 |   |              | 4.1<br>4.10             | <b> </b>   |   | <b> </b>                                | -  | <b> </b>                               | ╁  |
| Base Follow-Up Headway (sec)                  | 200200000000000000000000000000000000000   | 3.5                  | 1 0000000                   | 3.3                |  | 330000   |   | 19900000                                |              | 2.2                     | 1000000  | 200000                                  |   | 30000000   |  | <b>1</b> 20 0 5 3  |
| Follow-Up Headway (sec)                       |   | 3.53                 | -                           | 3.30               |  |  | -                                       |   | l            | 2.20                    | <u> </u>   |   | <b> </b>                                | -  | <b> </b>                               | <b> </b>   |
| Delay, Queue Length, and                      | Leve  | denicon com          | ervica                      | L                  |  | <b>I</b>   |   |   |              | LES                     | <u> </u>   | 1                                       |   |  | <u> </u>                               | <u> </u>   |
|   |   |                      |                             |                    |  |  |   |   |              |                         | 5-1446 (A)   |   |   |  |  |  |
|   |   | T                    | 7~                          | T*********         | Salvamore Are  | ***************************************  | -                                       | THE PERSON NAMED IN COLUMN              | E CONTRACTOR | -                       | T  | **************************************  | TE STATE OF THE STATE OF                | <b>***************</b>   | CONTRACTOR OF STREET                   | A650 4960  |
| Flow Rate, v (veh/h)                          |   |                      | 70<br>051                   |                    |  |  |   |   |              | 7                       |  |   |   |  |  |  |
|   |   |                      | 70<br><b>951</b><br>0.07    |                    |  | Committee of the control of the cont |   | Contractor Language                     |              | 7<br>1573<br>0.00       | TOTO CONTRACTOR OF THE PARTY OF |   |   |  |  |  |

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9.1

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1.8

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95% Queue Length, Q<sub>41</sub> (veh)

Control Delay (s/veh)

Level of Service (LOS)

Approach LOS

Approach Delay (s/veh)

|   |                  | Н  | CS7                           | Wo-                                    | Way                                    | Stop   | o-Col                     | ntrol                 | Rep                                     | ort   |                              |                           |  |  |  |  |
|---|------------------|--|-------------------------------|--|--|--|---------------------------|-----------------------|---|---|------------------------------|---------------------------|--|--|--|--|
| Seneral Information   |                  |  | - ANY - 244-A                 | in in sever                            |  |  | Site                      | nforn                 | nation                                  | 1   |                              | 04003002                  |  |  |  | e in a   |
| Analyst   | DBZ              |  |                               |  |  | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,   | Inters                    | ection                | ********                                | 2   | Old H                        | eady at                   | Chenow   | eth Ru   | *************                                    | A STANSON OF THE PERSON OF THE |
| Agency/Co.  |                  | B Zimm                                   | erman Ti                      | raffic En                              | gineering                              | 1  | Jurisd                    | iction                |   | 55 55 4   |                              |                           |  |  | ***************************************          |  |
| Date Performed  | 4/27/2           | Salainni Olivi embir                     | egitaron propinsion (company) | THE SOUTH PROPERTY.                    | <del>(4010/00/07/18/18</del> 0         | AIRISIMIGESIGONIQ  | East/V                    | Vest Stre             | et                                      | van der ander de  | Chenc                        | oweth Ri                  | un Road  | and the same   | <del>(</del>                                     | ······································   |
| Analysis Year   | 2025             |  | <del></del>                   |  | MOTOR BADDED                           |  | North                     | /South S              | treet                                   | ·   | Old H                        | eady Ro                   | ad   |  |  |  |
| Time Analyzed   | AM Pr            | ak Build                                 |                               | ······································ |  | **********   | Peak I                    | Hour Fac              | tor                                     | ************  | 0.57                         |                           | ***************************************  | a and the state of |  | <del></del>  |
| Intersection Orientation  | North            | -South                                   |                               |  |  |  | Analy                     | sis Time              | Period (                                | hrs)  | 0.25                         |                           |  |  |  |  |
| Project Description   | Old H            | eady                                     | <u> </u>                      |  | <del></del>                            | ALEXANDER OF THE PROPERTY OF T | -                         | er/enotweenotore      | ************                            |   |                              |                           |  |  | oo santaan                                       | ***************************************  |
| anes  | 101 102 1036     | Legaliya etti                            |                               |  |  | ,  |                           |                       |   |   |                              |                           |  | 9 10 10 L  |  | ***************************************  |
|   |                  |  |                               |  |  | 144  |                           | ****                  | *************************************** | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,  | *****                        | **********                | **********   | downskie de Leise de   | <del>)////////////////////////////////////</del> | -costonosto  |
|   |                  |  |                               |  | o at                                   | *<br>1835  |                           |                       |   |   |                              |                           |  |  |  |  |
| Vehicle Volumes and Adju  | ıstme            |  |                               |  | Major                                  | Street: Nor  |                           | ne mare le a          |   |   |                              |                           | *  |  |  |  |
| Approach  |                  |  | ound                          | VIII VIII VIII VIII VIII VIII VIII VII |  | g  | oound                     |                       |   | g   | bound                        | Salara Maria Cara         | 1000 A CALCOLO   | gannonononono  | bound  | e de la composición dela composición de la composición dela composición de la composición de la composición dela composición dela composición de la composición de la composición dela composición de la composición dela composición dela composición |
| Movement  | U                | L.                                       | T                             | R                                      | U                                      | 1  | Ţ                         | R                     | U                                       | L   | T                            | R                         | L.U.   | L  | T  | R  |
| Priority  | L                | 10                                       | 11                            | 12                                     |  | 7  | 8                         | 9                     | 1U                                      | 1   | 2                            | 3                         | 4U   | 4  | 5  | 6  |
| Number of Lanes   | -                | 0  | 1                             | 0                                      |  | 0  | 1                         | 0                     | 0                                       | 0   | 1                            | 0                         | 0  | 0  | 1  | 0  |
| Configuration   |                  |  | LTR                           |  |  |  | LTR                       |                       |   |   | LTR                          |                           | Total Contraction  |  | LTR  | ļ  |
| Volume (veh/h)  |                  | 34                                       | 3                             | 6                                      | SHI'US SHI'US                          | 4  | 8                         | 67                    |   | 4   | 12                           | 2                         | <b>!</b>   | 21   | 6  | 21   |
| Percent Heavy Vehicles (%)  | <b></b>          | 3  | 0                             | 0                                      | ZWINAS SEUMAZANO                       | 3  | 3                         | 3                     | unazinawa noa                           | 0   |                              | <b> </b>                  |  | 5  |  | -  |
| Proportion Time Blocked   | <b> </b>         |  |                               |  |  |  |                           | <u> </u>              |   |   | <u> </u>                     | <u> </u>                  | <b>_</b>   | L  | 1  | 1  |
| Percent Grade (%)   |                  | •  | D                             | rice viceo vi                          |  | (ardinahahan minahan)  | 0                         | eruskasensayuktasensi | Mary Mary Mary Mary Mary Mary Mary Mary | огоном пенерируан<br>Статов по статов по ст |                              | SACTOR AND A STATE OF THE |  | order of the control   |  | SSS AND S  |
| Right Turn Channelized  | <b> </b>         |  |                               | l le di                                | vided                                  | nanakan kan kan  | Name and America          |                       |   |   |                              |                           | l  |  | ***************************************          |  |
| Median Type   Storage   | L                | MANAGEMENT OF THE STREET                 |                               | UNU                                    | vided                                  |  |                           | 887780008             |   | 15003505  |                              | 3640500                   | Q-1685 15880A  | 101 (215) (8)  |  |  |
| Critical and Follow-up He   | adwa             | ys                                       | -                             | _                                      | <b>,</b>                               | ,  | ,                         | <b></b>               |   | ,   |                              |                           |  |  | _  | Ţ  |
| Base Critical Headway (sec)   | ·                | 7.1                                      | 6.5                           | 6.2                                    |  | 7.1  | 6.5                       | 6.2                   |   | 4.1   | <b>.</b>                     |                           |  | 4.1  | ļ  |  |
| Critical Headway (sec)  |                  | 7.13                                     | 6.50                          | 6.20                                   |  | 7.13   | 6.53                      | 6.23                  |   | 4.10  |                              |                           |  | 4.15   |  | ļ  |
| Base Follow-Up Headway (sec)  | 9                | 3.5                                      | 4.0                           | 3.3                                    | 40000000000000000000000000000000000000 | 3.5  | 4.0                       | 3.3                   | onespervenses                           | 2.2   |                              | as after a section        | A STATE OF THE STA | 2.2  |  | 1  |
| ***************************************   | La salas busasas | A 100 100 100 100 100 100 100 100 100 10 |                               |  |  |  | 4.03                      | 3.33                  |   | 2.20  |                              |                           | 1  | 2.25   |  | 1  |
| Follow-Up Headway (sec)   | 010400-00700-00  | 3,53                                     | 4.00                          | 3.30                                   | <u> </u>                               | 3.53   |                           | A                     | 30 <del></del>                          | -Foresteen Commission   | (Date Control of the Control | ****                      | American de la composición dela composición de la composición de la composición dela composición dela composición dela composición dela composición de la composición dela composición del | A.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,   |  |  |
| ***************************************   | l Leve           | Jacobson son.                            |                               |  | 0.00.00                                | 3.53   | L                         | <b></b>               | <b></b>                                 |   |                              |                           | J.   |  |  |  |
| Follow-Up Headway (sec)   | l Leve           | Jacobson son.                            |                               |  |  | 3.53   | 139                       |                       |   | 7   |                              |                           |  | 37   |  | Ι  |
| Follow-Up Headway (sec)<br>Delay, Queue Length, and   | Leve             | Jacobson son.                            | ervice                        |  |  | 3.53   |                           |                       |   | 7<br>1573<br>0.00   |                              |                           |  | 37<br>1571<br>0.02   | <b>3</b> (9)                                     |  |
| Follow-Up Headway (sec)  Delay, Queue Length, and Flow Rate, v (veh/h)  Capacity, c (veh/h)   | I Leve           | Jacobson son.                            | 75<br>685                     |  |  | 3.53   | 139<br>987                |                       |   | 1573  |                              |                           |  | 1571   | 387.990  |  |
| Follow-Up Headway (sec)  Delay, Queue Length, and  Flow Rate, v (veh/h)  Capacity, c (veh/h)  v/c Ratio                             | l Leve           | Jacobson son.                            | 75<br>685<br>0.11             |  |  | 3.53   | 139<br>987<br>0.14        |                       |   | 1573<br>0.00  |                              |                           |  | 1571<br>0.02   |  |  |
| Follow-Up Headway (sec)  Delay, Queue Length, and Flow Rate, v (veh/h)  Capacity, c (veh/h)  v/c Ratio  95% Queue Length, Qas (veh) | I Leve           | Jacobson son.                            | 75<br>685<br>0.11             |  |  | 3.53   | 139<br>987<br>0.14<br>0.5 |                       |   | 0.00<br>0.00  |                              |                           |  | 1571<br>0.02<br>0.1  |  |  |

|  |                                       | H               | CS7   | Two  | -Way                                    | Sio                | o-Co                                    | ntro   | Rep         | ort   |   |  |  |   |  |  |
|--|---------------------------------------|-----------------|---|--|---|--------------------|---|--|-------------|---|---|--|--|---|--|--|
| General Information                                  |                                       |                 |   |  |   |                    | Site                                    | Infor  | matio       | n   |   |  |  |   | estimation of  | /  |
| Analyst  | DBZ                                   |                 |   |  |   |                    | <b>!</b>                                | ection   |             | CONTRACTOR OF THE PARTY OF THE | ONF                                     | eadu at  | Chenow   | eth P.,                                       | COMPANIAN DESCRIPTION OF THE PROPERTY OF THE P | - CONTRACTOR OF THE CONTRACTOR |
| Agency/Co.   | ļ                                     | R Zimm          | erman 1   | rattic En  | gineerin                                | n                  |   | fiction  | 66 24 23    |   | 0.01                                    | icaby at   | CHEILOW  | eui No  |  | 188 188 18   |
| Date Performed                                       | 4/27/                                 | *************** | MANAGO   | **************************************   |   |                    |   | West Str   | eet         |   | Chen                                    | oweth R  | un Road  | ****  |  |  |
| Analysis Year  | 2021                                  |                 | 54.5  |  |   | 33.66              |   | n/South  | *********** | 60.60   | ļ.,,,,,,,,,,,,,                         | leady Ro   | <del>eroteiseinen ja</del>   |   |  | Ali da s   |
| Time Analyzed  | PM Pe                                 | eak             |   |  | 140000000000000000000000000000000000000 |                    | Peak                                    | Hour Fa  | ctor        | ***************************************   | 0.71                                    |  | and the same of th | PHOTOMORE IN THE                              | - CONTRACTOR OF THE PROPERTY   | OF THE PARTY OF TH |
| Intersection Orientation                             | North                                 | -South          | techen militara anni e  |  |   | awata wata d       | Analy                                   | /sis Time  | Period (    | (hrs)   | 0.25                                    |  |  |   | AND CONTRACTOR   |  |
| Project Description                                  | Old H                                 | leady           | CONTRACTOR OF THE PROPERTY OF | and discount of the second   | ennessonaniskosans                      | ow/oralestatester/ | · Commence                              | ************                                     |             |   | E.,,,,,,,,,,,,                          | ***************************************  | WEEK-COOK (WSHOW)  |   |  | ***************************************  |
| Lanes  |                                       |                 |   |  |   |                    |   |  |             |   |   | ***************************************  |  | ***************************************       |  | CONTRACT FROM  |
|  |                                       |                 |   |  |   | Street: No         | th-South                                |  |             |   |   |  |  |   |  |  |
| Vehicle Volumes and Adju                             | istme                                 | nts             |   |  |   |                    |   |  |             |   |   |  | ****   |   |  | 434 W. C.  |
| Approach   |                                       | Eastt           | ound  |  |   | West               | bound                                   |  |             | North   | bound                                   |  |  | South   | bound  | ·  |
| Movement   | U                                     | L               | Ţ   | R  | ับ                                      | L                  | Ī                                       | R  | U           | h - 1   | J                                       | R  | U  | L   | Ť  | R  |
| Priority   |                                       | 10              | 11  | 12   |   | 7                  | 8                                       | 9  | 1U          | 1   | 2                                       | 3  | 4U   | 4   | 5  | 6  |
| Number of Lanes                                      |                                       | 0               | 1   | 0  |   | 0                  | 0                                       | 0  | 0           | 0   | 1                                       | 0  | 0  | 0   | 1  | 0  |
| Configuration  |                                       |                 | LR  | <b></b>  |   | ļ                  | <b>_</b>                                | <u> </u>   |             | LT  |   |  | <u> </u>   |   |  | TR   |
| Volume (veh/h)                                       |                                       | 44              |   | 9  | -                                       |                    | -                                       | <b>-</b>   | <b>_</b>    | 12  | 14                                      |  |  |   | 23   | 35   |
| Percent Heavy Vehicles (%)                           | -                                     | 3               |   | 0  |   | V                  |   |  | <b>_</b>    | 0   | <b></b>                                 |  | ļ  |   |  |  |
| Proportion Time Blocked                              |                                       | 45555           |   | 1  |   |                    |   | 1  | <b> </b>    |   |   | 30000  |  |   | <u> </u>   |  |
| Percent Grade (%) Right Turn Channelized             |                                       | ************    | 0   | mare de la companyon de la com | · ·                                     | MICHAGONA EAGANA   | facilia (Nobile Carolina Anna A         | mjerieljusjuski darbei drže                      | <b>_</b>    | Marine outer Systems  | *************************************** | Managura da de la composição de la compo |  |   | ,  | 115 m par (m. 114 m).  |
| Median Type   Storage                                | 20000000                              |                 | 00000   | lindi  | vided                                   | 1400,0300          | *************************************** | ***************************************          | <b>!</b>    | ZANI SANISAN S  | 30.591.032                              | 10000000   | 1 000000   |   |  | 200000000000000000000000000000000000000  |
| Critical and Follow-up He                            |                                       |                 | ***************************************   | Ond  | - West                                  | woles work syny    |   |  | L           | unicated the second   |   |  | ************   |   |  |  |
|  | auwa                                  | _               | T   | 1  | T                                       |                    | T                                       |  |             | 1   | T                                       | T  | T T  | 1   | T  | <del> </del>   |
| Base Critical Headway (sec)                          | ļ                                     | 7.1             | -   | 6.2<br>6.20  | -                                       |                    | -                                       | -  | -           | 4.10  | <b> </b>                                |  | <b>_</b>   |   |  | <b>_</b>   |
| Critical Headway (sec)  Base Follow-Up Headway (sec) | 1 2000000                             | 6.43<br>3.5     | <b>1</b> 88 88 68   | 3.3  | 1 303370                                | 15889X8VX          |   | 1881088  | 1           | 2.2   |   | 1000000  |  | 12/35%<br>1                                   |  | 1000000  |
| Follow-Up Headway (sec)                              | \$ 5500                               | 3.53            |   | 3.30   |   | -                  | 1                                       | -  | 1           | 2.20  | -                                       | 77.00  | <b> </b>   |   | <b> </b>   | <b> </b>   |
|  | ـــــــــــــــــــــــــــــــــــــ | <b></b>         |   |  | <u> </u>                                |                    | <u> </u>                                | 1  |             | 1   |   |  |  |   | 1  | 1  |
| Delay, Queue Length, and                             | LEVE                                  | 1 01 31<br>T    | of the second   | T  | T                                       | <b></b>            | T                                       |  | T           | T   | T                                       | 1  | г  | Y   | T  | <del>1</del>   |
| Flow Rate, v (veh/h)                                 | 32 224 34                             |                 | 75  | 10000  |   |                    | <u> </u>                                |  | <b>}</b>    | 17  | 1                                       |  | <b>!</b>   | Busans  |  | <b>_</b>   |
| Capacity, c (veh/h)  v/c Ratio                       |                                       | <b>!</b>        | 895<br>0.08   |  | 120503                                  |                    | 1                                       | <del>                                     </del> | 1           | 1529<br>0.01  | 1                                       | 1  | 1  |   |  | <b>!</b>   |
| 95% Queue Length, Q <sub>ss</sub> (veh)              |                                       | <b> </b>        | 0.3   |  |   |                    | -                                       |  | <b> </b>    | 0.0   | <b>L</b> -                              | 75.000   | <b>L</b>   |   | <b> </b>   | 1  |
| Control Delay (s/veh)                                |                                       | 1 2000 2000     | 9.4   | 1 0000000  |   |                    | 20.000.00                               |  |             | 7.4   | 1455050                                 | 50.00000   |  |   | 1  |  |
| Level of Service (LOS)                               | -                                     |                 | A   | <b> </b>   | -                                       | PRODUCEROSCO       | -                                       | -  | 1           | A   | <b>+</b>                                |  | <b> </b>   |   | <b></b>  | <b>†</b>   |
| Approach Delay (s/veh)                               | g 50.090,0000                         | 1               | ),4   | g 1994 (1995)  | 120000000                               |                    | 1                                       | - 2000 CIV                                       | 1           |   | 1<br>3.5                                | <b>3</b> (2000)  | 1 1000000  | * 1840 S. | • areases.   | : <b>*</b> - 10.555 (1.55  |
|  | L                                     |                 |   |  |   |                    |   |  | £           |   | -                                       |  | E .  |   |  |  |

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|   |               | Н  | CS7   | Two                                     | -Way                                    | Stop   | о-Со                                    | ntrol    | Rep               | ort   |             |  |   |  |   |                            |
|---|---------------|--|---|---|---|--|---|----------|-------------------|---|-------------|--|---|--|---|----------------------------|
| General Information   |               |  |   |   |   |  | Site                                    | Infor    | natio             | 1   |             |  |   |  |   | as an                      |
| Analyst   | D8Z           | M  | ******************                              | *************************************** |   | ***************************************  | Inter                                   | section  | **********        | P-20100 - 20110                                     | Old H       | leady at                               | Chenow                                  | eth Ru   |   | <del>sections comple</del> |
| Agency/Co.  | ************* | B Zimn   | nerman 1  | raffic En                               | gineerin                                | a  | <u> </u>                                | liction  |                   |   |             |  |   |  |   |                            |
| Date Performed  | 4/27/         | ····   | <del>and the second c</del> are t               |   | *************************************** | <del>onto lo conto lo</del>  | East/                                   | West Str | et                | comi Windowy yn d                                   | Chen        | oweth R                                | un Road                                 | Onne ( Marie 1990)                                 | NEFF CHICKON CHESTOFF                   |                            |
| Analysis Year   | 2025          | 755 A-7<br>2000 NESS A                           |   |   |   |  | •                                       | n/South  |                   |   | OKI H       | leady Ro                               | ad                                      | 0/3400000000000000000000000000000000000            | *************                           |                            |
| Time Analyzed   | PM P          | eak No I   | Build   | ikida ar radi adalah                    |   | ***************************************  | *************************************** | Hour Fac | SOUTO ESCHAPATION |   | 0.71        |  |   |  | *************************************** | **********                 |
| Intersection Orientation  | North         | i-South  |   |   |   |  | Anah                                    | sis Time | Period (          | hrs)  | 0.25        |  | DED PROPERTY AND A                      | <del>(1)000000000000000000000000000000000000</del> |   | 60/60                      |
| Project Description   | Old H         | leady  |   | *************************************** |   | II SCORE II |   |          |                   | ***********   |             |  |   | Ameros=Societa esta                                | *************************************** | -                          |
| Lanes   |               |  |   |   |   |  |   |          |                   |   |             |  |   |  |   |                            |
|   |               |  |   |   |   | 1  |   |          |                   |   |             |  |   |  |   |                            |
| Vehicle Volumes and Adju  | istme         |  |   |   | Wajor                                   | Street: No   | tn-South                                |          | r                 |   | ***         |  | r                                       |  | **************************************  |                            |
| A   | í             | C1   |   |   | ŧ                                       |  |   |          |                   |   |             |  |   |  |   |                            |
| Approach  |               | Reseason annum                                   | ound  | T a                                     | <u> </u>                                | Žurnon mennone   | bound                                   | 1 6      |                   | ***********   | bound<br>T  | 1 6                                    |   | ·  | bound                                   | T 5                        |
| Movement  | Ü             | I I  | T   | R                                       | U                                       | ľ  | Т                                       | R        | U                 | L.  | Т           | R                                      | Ü                                       | L  | T                                       | R                          |
| Movement<br>Priority  | U             | 10   | T<br>11   | 12                                      | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | 1   | T<br>2      | 3                                      | 4U                                      | L<br>  4   | <b>T</b> 5                              | 6                          |
| Movement Priority Number of Lanes   | Ü             | I I  | 11<br>1   | VIOLENCE NEW PROPERTY.                  | U                                       | ľ  | Т                                       |          | -                 | 1<br>0  | Т           | ************************************** | *************************************** | L  | T                                       | 6                          |
| Movement Priority Number of Lanes Configuration   | Ü             | 10<br>0  | T<br>11   | 12<br>0                                 | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | L<br>1<br>0<br>LT                                   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | C<br>Ti                    |
| Movement Priority Number of Lanes Configuration Volume (veh/h)  | U             | 10<br>0<br>48                                    | 11<br>1   | 12<br>0<br>10                           | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2      | 3                                      | 4U                                      | L<br>  4   | <b>T</b> 5                              | 6<br>0<br>11               |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%)   | U             | 10<br>0  | 11<br>1   | 12<br>0                                 | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | L<br>1<br>0<br>LT                                   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | C<br>Ti                    |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked   | U             | 10<br>0<br>48<br>3                               | 11 1 LR   | 12<br>0<br>10                           | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 6<br>0<br>11               |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%)   | U             | 10<br>0<br>48<br>3                               | 11<br>1   | 12<br>0<br>10                           | U                                       | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | C<br>Ti                    |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized  | U             | 10<br>0<br>48<br>3                               | 11 1 LR   | 12<br>0<br>10<br>0                      |   | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 6                          |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage  |               | 10<br>0<br>48<br>3                               | 11 1 LR   | 12<br>0<br>10<br>0                      | U V                                     | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 6<br>0<br>11               |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage  |               | 10<br>0<br>48<br>3                               | 11 1 LR   | 12<br>0<br>10<br>0                      |   | 1<br>7   | T<br>8                                  | 9        | 10                | 1<br>0<br>LT<br>13                                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 6<br>0<br>11               |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage  Critical and Follow-up He Base Critical Headway (sec)   |               | 48<br>3<br>3<br>7.1                              | 11 1 LR   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | 1 0 UT 13 0   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 6<br>0<br>11               |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec)  |               | 10<br>0<br>48<br>3<br>7.1<br>6.43                | 11 1 LR   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | 1 0 LT 13 0   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | C<br>Ti                    |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec)  |               | ys<br>7.1<br>6.43<br>3.5                         | 11 1 LR   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 0 14.1 4.10 2.2                       | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | ) (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)  | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 11 LR 00                                     | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | 1 0 LT 13 0   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | C<br>Ti                    |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Follow-Up Headway (sec)   | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 11 LR 00                                     | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 0 14.1 4.10 2.2                       | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | ) (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage  Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)   | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 11 LR 00                                     | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 0 14.1 4.10 2.2                       | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | ) (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, and   | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | T 11 11 LR 00                                   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 LT 4.1 4.10 2.2 2.20                  | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | ) (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, and Flow Rate, v (veh/h)  | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | T 11 1 LR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0                                       | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | T (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage  Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)  Pollow-Up Headway (sec) Delay, Queue Length, and Flow Rate, v (veh/h) Capacity, c (veh/h)              | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 11 1 LR 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 0                                     | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | ) (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Pollow-Up Headway (sec) Delay, Queue Length, and Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio      | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 1 1 LR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 LT 13 0 C C C C C C C C C C C C C C C C C C   | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | T (                        |
| Movement Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Pellay, Queue Length, and Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio 95% Queue Length, Qas (veh) | adwa          | 10<br>0<br>48<br>3<br>7.1<br>6.43<br>3.5<br>3.53 | 11 11 1 LR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | 12<br>0<br>10<br>0<br>Undi              |   | 1<br>7   | T<br>8                                  | 9        | 10                | L 1 0 UT 13 0 UT 14.10 2.2 2.20 18 18 1520 0.01 0.0 | T<br>2<br>1 | 3                                      | 4U                                      | L<br>  4   | 5<br>1                                  | 1                          |

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|   |        | ŀ  | CS7   | Two   | -Way                     | Sto   | o-Co  | ntiro                                   | Rep                                    | ort   |   |                      |  |   |  |                      |
|---|--------|--|---|---|--------------------------|---|---|---|--|---|---|----------------------|--|---|--|----------------------|
| General Information   |        |  |   |   |                          |   | Site  | Infor                                   | matio                                  | n   |   |                      |  |   |  |                      |
| Analyst   | DBZ    | - Calledon Calledon  |   |   | WORLDWAY COMMON DECEMBER | OVASemparinserii Rw   | inter                                       | section                                 |  | ***************************************                 | Old F                                   | leady at             | Chenov                                 | eth Ru  | manus karamanis                                    | Pecaromoromo         |
| Agency/Co.  | Dian   | e B Zimn   | nerman `  | Traffic Er  | gineerin                 | ю   | ļ   | liction                                 |  |   |   |                      |  |   |  |                      |
| Date Performed  | 4/27   | ***************************************  | ************  | *******************************                   |                          | - Andrews | East/                                       | West Str                                | eet                                    | AND SHIPASHUMAN   | Chen                                    | oweth F              | lun Road                               | ***************************************                         | nerowene (Verson)                                  | (Construence School) |
| Analysis Year   | 2025   | GENTHERODOONIA   |   |   |                          |   |   | h/South                                 | ······································ |   | ļ                                       | leady R              | 94904000000000000000000000000000000000 |   |  | 700 AS               |
| Time Analyzed   | *      | eak Buil   | d   |   |                          |   | -   | Hour Fa                                 | all the list of the same               |   | 0.71                                    |                      |  | destructions  |  | Andrew Andrew        |
| Intersection Orientation  | *      | n-South  | ************  | (Victorial Production of the                      |                          | tetra znarowstwo.   | Anah  | sis Time                                | Period                                 | (hrs)   | 0.25                                    | <i>птор</i> имецияни |  |   | *****  |                      |
| Project Description   | Old I  | leady  |   | NATIONAL PROPERTY.                                |                          |   |   | - 10 Marie 10 M                         |  | nomence and         |   |                      |  |   | SAN ALTONOMISSISSISSISSISSISSISSISSISSISSISSISSISS | <b>******</b>        |
| Lanes   |        |  |   |   |                          |   |   |   |  |   |   |                      |  | ***************************************                         |  |                      |
|   |        |  |   |   | n a                      | 1837  |   |   |  |   |   |                      |  |   |  |                      |
| Vehicle Volumes and Adju  | ustme  |  |   |   | Majo                     | r Street: No  |   |   |  |   |   |                      |  |   |  |                      |
| Approach  |        | - Contraction of the Contraction | oound   | g/mennene   |                          | Wiceless States   | bound                                       | dancer-rounner                          | _                                      | desire annual   | bound                                   | <b>Ž</b> imoninios   |  | South   | bound  | olaricinin-o         |
|   |        | L  | 1   | l R   | lυ                       | L   | T   | R                                       | U                                      | l L   | 1 1                                     | R                    | 1 U                                    | L   | i T  |                      |
| Movement  | U      |  | -   |   | <b>-</b>                 | •   |   | *************************************** | · municus success                      |   | *************************************** |                      | 4                                      | ***************************************                         | ennemmouseus.                                      | R                    |
| Priority  | ľ      | 10   | 11  | 12  |                          | 7   | 8   | 9                                       | 10                                     | 1   | 2                                       | 3                    | 4U                                     | 4   | 5  | 6                    |
| Priority Number of Lanes  |        |  | 11  | 12<br>0   |                          | 7<br><b>0</b>   | 1   | 9<br>0                                  | 1U<br>0                                | 1<br>0  |   |                      | 4                                      | ***************************************                         | 1  | -                    |
| Priority  Number of Lanes  Configuration  |        | 10<br>O  | 11<br>1<br>LTR  | 0   |                          | 0   | 1<br>LTR                                    | 0                                       |  | 0   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4   | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h)   | U      | 10<br>0<br>48  | 11<br>1<br>LTR<br>9   | 0<br>10   |                          | 3   | 1<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   |   | 3                    | 4U                                     | 4<br>0<br>76  | 1  | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%)  |        | 10<br>O  | 11<br>1<br>LTR  | 0   |                          | 0   | 1<br>LTR                                    | 0                                       |  | 0   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4   | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked  |        | 10<br>0<br>48<br>3   | 11 1 LTR 9 0  | 0<br>10   |                          | 3   | I<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76  | 1<br>LTR   | 6                    |
| Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  |        | 10<br>0<br>48<br>3   | 11<br>1<br>LTR<br>9   | 0<br>10   |                          | 3   | 1<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76  | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized   |        | 10<br>0<br>48<br>3   | 11 1 LTR 9 0  | 10<br>0   |                          | 3   | I<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76  | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage   |        | 10<br>0<br>48<br>3   | 11 1 LTR 9 0  | 10<br>0   | ivided                   | 3   | I<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76  | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage   |        | 10<br>0<br>48<br>3   | 11 1 LTR 9 0  | 10<br>0   | vided                    | 3   | I<br>LTR<br>5                               | 0<br>43                                 |  | 0<br>13   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76  | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec)   |        | 10<br>0<br>48<br>3<br>3  | 11 1 LTR 9 0 0 0 0 6.5  | 0<br>10<br>0                                      | wided                    | 3 0   | 1 LTR 5 0                                   | 43 3                                    |  | 13 0  | 1<br>LTR                                | 3<br>0               | 4U                                     | 76 3  | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec)   |        | 10<br>0<br>48<br>3<br>3<br>7.1<br>7.13   | 11 1 1 LTR 9 0 0 0 0 6.5 6.50                                   | 0 10 0 Und  | ivided                   | 7.1<br>7.10   | 1 LTR 5 0 0 0 0 6.5 6.50                    | 6.2<br>6.23                             |  | 13<br>0   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76<br>3   | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec)   |        | 10<br>0<br>48<br>3<br>7.1<br>7.13<br>3.5   | 11 1 1 LTR 9 0 0 0 0 6.5 6.50 4.0                               | 0 10 0 Und  | ivided                   | 7.1<br>7.10<br>3.5  | 1 LTR 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2                                      | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76<br>3<br>4.1<br>4.13<br>2.2                         | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)   | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 LTR 9 0 0 0 6.5 6.50 4.0 4.00                            | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | vided                    | 7.1<br>7.10   | 1 LTR 5 0 0 0 0 6.5 6.50                    | 6.2<br>6.23                             |  | 13<br>0   | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76<br>3   | 1<br>LTR   | 1                    |
| Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up He  Base Critical Headway (sec)  Critical Headway (sec)  Base Follow-Up Headway (sec)  Follow-Up Headway (sec)  | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 LTR 9 0 0 0 6.5 6.50 4.0 4.00                            | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | wided                    | 7.1<br>7.10<br>3.5  | 1 LTR 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2                                      | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76<br>3<br>4.1<br>4.13<br>2.2                         | 1<br>LTR   | 6                    |
| Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up He  Base Critical Headway (sec)  Critical Headway (sec)  Base Follow-Up Headway (sec)  Follow-Up Headway (sec)  | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 LTR 9 0 0 0 6.5 6.50 4.0 4.00                            | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | wided                    | 7.1<br>7.10<br>3.5  | 1 LTR 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2                                      | 1<br>LTR                                | 3<br>0               | 4U                                     | 4<br>0<br>76<br>3<br>4.1<br>4.13<br>2.2                         | 1<br>LTR   | 1                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, and  | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                          | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | ivided                   | 7.1<br>7.10<br>3.5  | 1<br>LTR<br>5<br>0<br>0                     | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2<br>2.20                              | 1<br>LTR                                | 3<br>0               | 4U                                     | 4.1<br>4.1<br>4.13<br>2.2<br>2.23                               | 1<br>LTR   | 1                    |
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| Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up He  Base Critical Headway (sec)  Critical Headway (sec)  Base Follow-Up Headway (sec)  Follow-Up Headway (sec)  Delay, Queue Length, and  Flow Rate, v (veh/h)  Capacity, c (veh/h)   | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11<br>1 LTR<br>9 0<br>0<br>6.5<br>6.50<br>4.0<br>4.00<br>ervice | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | vided                    | 7.1<br>7.10<br>3.5  | 1<br>LTR<br>5<br>0<br>0<br>                 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2<br>2.20                              | 1<br>LTR                                | 3<br>0               | 4U                                     | 4.1<br>4.1<br>4.13<br>2.2<br>2.23                               | 1<br>LTR   | 6                    |
| Priority  Number of Lanes  Configuration  Volume (veh/h)  Percent Heavy Vehicles (%)  Proportion Time Blocked  Percent Grade (%)  Right Turn Channelized  Median Type   Storage  Critical and Follow-up He  Base Critical Headway (sec)  Critical Headway (sec)  Base Follow-Up Headway (sec)  Follow-Up Headway (sec)  Pollow-Up Headway (sec)  Delay, Queue Length, and  Flow Rate, v (veh/h)  Capacity, c (veh/h)  v/c Ratio                       | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                          | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | wided                    | 7.1<br>7.10<br>3.5  | 1 LTR 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2<br>2.20<br>18<br>1520<br>0.01        | 1<br>LTR                                | 3<br>0               | 4U                                     | 4.1<br>4.13<br>2.2<br>2.23<br>107<br>1581<br>0.07               | 1<br>LTR   | 6                    |
| Priority Number of Lanes Configuration Volume (veh/h) Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type   Storage Critical and Follow-up He Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Pollow-Up Headway (sec) Delay, Queue Length, and Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio 95% Queue Length, Q <sub>95</sub> (veh) | Saciwa | 7.1<br>7.13<br>3.5<br>3.53   | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                          | 0<br>10<br>0<br>Und<br>6.2<br>6.20<br>3.3<br>3.30 | ivided                   | 7.1<br>7.10<br>3.5  | 1 LTR 5 0 0                                 | 6.2<br>6.23<br>3.3                      |  | 4.1<br>4.10<br>2.2<br>2.20<br>18<br>1520<br>0.01<br>0.0 | 1<br>LTR                                | 3<br>0               | 4U                                     | 4.1<br>4.1<br>4.13<br>2.2<br>2.23<br>107<br>1581<br>0.07<br>0.2 | 1<br>LTR   | 6                    |

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VIA EMAIL

January 29, 2021

Mr. David Baldridge
Chief, South Branch Regulatory Division
U.S. Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King, Jr. Place
Louisville, Kentucky 40202
David.E.Baldridge@usace.army.mil
CELRL.Door.To.The.Corps@usace.army.mil

Subject: Request for Jurisdictional Determination – DRAFT

Old Heady Property Jefferson County, Kentucky Redwing Project No.: 20-236

Dear Mr. Baldridge:

On behalf of Sunshine Builders, LLC, RES Kentucky, LLC dba Redwing (Redwing) is pleased to submit this Request for Jurisdictional Determination to the U.S. Army Corps of Engineers (USACE) for the approximately 55-acre project site located on the north side of Old Heady Road, immediately West of I-265 in Jefferson County, Kentucky (Figure 1). This report describes the location, extent, and characteristics of waters/wetlands that were delineated within the project boundary.

The project site consists primarily of upland mixed-age woods, maintained open field and old field habitat (Figure 2). Based on the water/wetland delineation, jurisdictional features on the site include six intermittent streams totaling 3,138 linear feet and one open water pond measuring 0.716 acre. The non-jurisdictional water/wetland features identified on site include 23 ephemeral streams totaling 2,611 linear feet (Figure 3). These ephemeral streams are considered non-jurisdictional features under the Navigable Waters Protection Rule (NWPR 2020). No wetlands were identified on site.

#### **METHODOLOGY**

Redwing wetland scientists conducted a delineation of the site on January 11, 2021. The wetland delineation was accomplished through documentation of the presence/absence of hydric soils, wetland hydrology, and hydrophytic vegetation according to the Routine On-Site Determination Method, as defined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (April 2012). The presence of open waters, such as streams and ponds, within the project boundary was determined based on ordinary high water mark (OHWM), defined bed and bank features, and flow regime.

#### **RESULTS**

Based on the water/wetland delineation, jurisdictional features on site include:

- six jurisdictional intermittent streams totaling 3,138 linear feet (0.406 acre)
- one open water pond measuring 0.716 acre

Non-jurisdictional water/wetland features identified during the field assessment include 23 ephemeral streams totaling 2,611 linear feet (0.097 acre). No wetlands were present. Wetland determination data were formally collected at four data points within the project boundary (Figure 3) and are attached as Appendix A. The quality of intermittent streams was assessed using Rapid Bioassessment Protocol (RBP) methodology established by the U.S. Environmental Protection Agency (USEPA). The RBP forms are provided as Appendix B. An Approved Jurisdictional Determination Form is provided as Appendix C. The results of the water/wetland delineation are summarized in Table 1 (attached), depicted on Figure 3, and discussed below.

**Intermittent Stream:** Six intermittent streams were identified during the field assessment. All of them generally flow eastward and contribute flow to downstream navigable waters via Shinks Branch, Chenoweth Run, and Floyds Fork. Thus, they are considered to be under USACE jurisdiction.

Intermittent Stream 1 is three to seven feet wide with silt, sand, gravel, cobble and bedrock substrate. During the field assessment, Intermittent Stream 1 had flowing water at depths of up to six inches. One RBP point was assessed along Intermittent Stream 1 with a score of 104 which characterizes it as "Poor" quality.

Intermittent Stream 2 is approximately seven feet wide with silt, sand, gravel, cobble, boulders and bedrock substrate. During the field assessment, Intermittent Stream 2 had flowing water at depths of up to six inches. Two RBP points were assessed along Intermittent Stream 2 with a score of 115 and 110 which characterizes it as "Poor" quality.

Intermittent Stream 3 is three to five feet wide with silt, sand, gravel and cobble substrate. During the field assessment, Intermittent Stream 3 had flowing water at depths less than six inches. One RBP point was assessed along Intermittent Stream 3 with a score of 100 which characterizes it as "Poor" quality.

Intermittent Stream 4 is two to four feet wide with silt, sand, gravel and cobble substrate. During the field assessment, Intermittent Stream 4 had flowing water at depths less than six inches. One RBP point was assessed along Intermittent Stream 4 with a score of 115 which characterizes it as "Poor" quality.

Intermittent Stream 5 is three to six feet wide with silt, sand, gravel, cobble and bedrock substrate. During the field assessment, Intermittent Stream 5 had flowing water at depths less than six inches. One RBP point was assessed along Intermittent Stream 5 with a score of 98 which characterizes it as "Poor" quality.

<u>Intermittent Stream 6</u> is two to five feet wide with silt, sand, gravel and cobble substrate. During the field assessment, Intermittent Stream 6 had flowing water at depths less than six inches. One RBP point was assessed along Intermittent Stream 6 with a score of 66 which characterizes it as "Poor" quality.

**Ephemeral Streams:** A total of 23 ephemeral streams were identified within the project boundary. The ephemeral streams are approximately one to two feet wide with bank heights ranging from one to two feet. The substrates consist primarily of silt with scattered gravel and cobble. Only shallow isolated standing pools of water were observed within the banks of the ephemeral streams during the field assessment, confirming that they only flow in direct response to precipitation. Thus, they are considered non-jurisdictional features under the NWPR.

Wetlands: No wetlands were identified on the site during the field assessment.

General site characteristics of soil, hydrology, and vegetation for the project are discussed below.

**Soils:** The USDA Soil Survey Geographic Database for Jefferson County, Kentucky maps the site as being underlain primarily by Beasley silt loam, Crider silt loam, Nicholson silt loam, and Shrouts silt loam (Figure 4). None of these soils are listed on the Hydric Soil List for Jefferson County, Kentucky. No hydric soil indicators were observed on site.

**Hydrology:** The main sources of hydrology to the site include direct precipitation and surface runoff from adjacent areas. The site is not located within the 100-year floodplain (Figure 5). No wetland hydrology indicators were observed at the four wetland data point locations.

**Vegetation:** The project boundary consists primarily of mixed-age upland woods, maintained open field, and old field habitat (Figure 2). No wetland plant communities were observed.

Common species in the upland woods habitat include: eastern red cedar (*Juniperus virginiana*), bush honeysuckle (*Lonicera maackii*), chinkapin oak (*Quercus muehlenbergii*), white oak (*Quercus alba*) and shagbark hickory (*Carya ovata*). These species are listed as upland (UPL) and facultative upland (FACU), in the *National Wetland Plant List: Eastern Mountain and Piedmont Final Regional Wetland Plant List – 2018, Version 3.4* (NWPL).

Common species in the maintained open field habitat include: tall fescue (*Schedonorus arundinaceus*), yellow foxtail (*Setaria pumila*), nodding foxtail (*Setaria faberi*), broomsedge (*Andropogon virginicus*), and white clover (*Trifolium repens*). These species are listed as UPL, FACU, and facultative (FAC) in the NWPL.

Common species in the old field habitat include: eastern red cedar, tall fescue, yellow foxtail, nodding foxtail, broomsedge, Johnson grass (*Sorghum halepense*), multiflora rose (*Rosa multiflora*), and green ash (*Fraxinus pennsylvanica*). These species are listed as UPL, FACU, and FAC in the NWPL.

**Open Water:** Open Water Pond 1 is located in the south-central portion of the site. It measures 0.716 acre with an estimated maximum depth of eight feet and a primarily silt substrate. Pond 1 is hydrologically supplied by surface water and flows directly discharged from Intermittent Stream 5. The pond outlets to Intermittent Stream 6 via a culvert located in the southwest corner of the pond. This feature is considered jurisdictional based on its immediate downstream connection to Intermittent Stream 6.

#### CONCLUSION

This water/wetland delineation identified six jurisdictional intermittent streams totaling 3,138 linear feet (0.406 acre) and one open water pond measuring 0.716 acre within the project boundary. The non-jurisdictional water/wetland features identified during the field assessment include 23 ephemeral streams totaling 2,611 linear feet (0.097 acre). As the USACE holds final authority over determinations of the extent and location of jurisdictional waters/wetlands, we respectfully request USACE verification of delineated water/wetland boundaries and issuance of an Approved Jurisdictional Determination for the property.

We appreciate your review of this request. Please contact Rich Fangman or Ronald Thomas at (502) 625-3009 with any questions regarding this report or the overall project.

Sincerely,



Project Manager I

DRAFT
Ronald L. Thomas
Senior Project Manager

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cc: Mr. Damon Garrett - Sunshine Builders, LLC

Attachments: Table

Figures Photographs

Appendix A: Wetland Determination Data Forms Appendix B: Rapid Bioassessment Protocol Form

Appendix C: Approved Jurisdictional Determination Form (Interim)

# TABLE

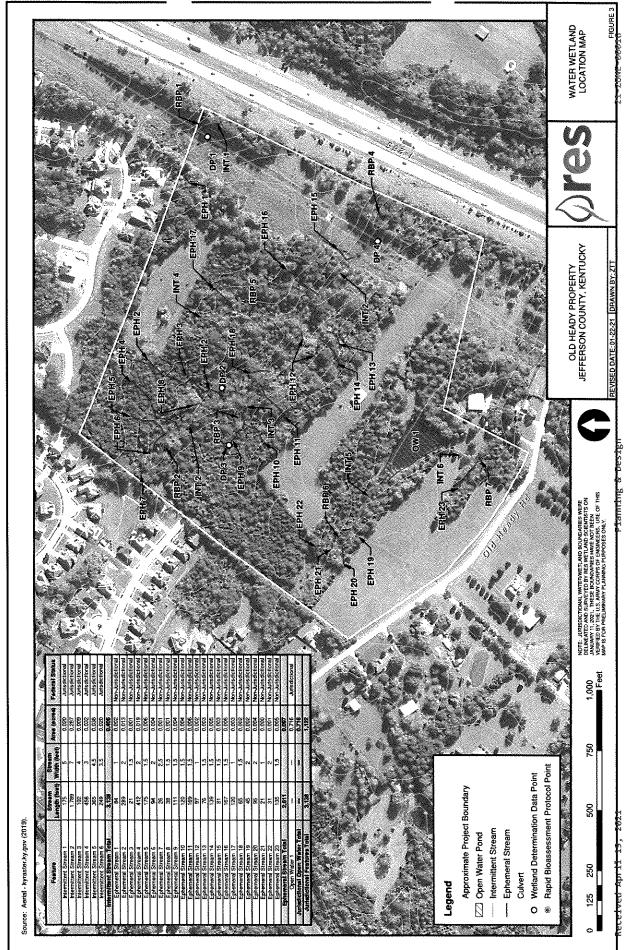
#### Table 1: Water/Wetland Summary Old Heady Property Jefferson County, Kentucky Redwing Project: 20-236

|                                 | 9 7           |              |              | · · · · · · · · · · · · · · · · · · · |
|---------------------------------|---------------|--------------|--------------|---------------------------------------|
| Feature                         | Stream        | Stream Width | Area (acres) | Federal Status                        |
|                                 | Length (feet) | (feet)       | · ·          |                                       |
| Intermittent Stream 1           | 175           | 5            | 0.020        | Jurisdictional                        |
| Intermittent Stream 2           | 1,789         | 7            | 0.287        | Jurisdictional                        |
| Intermittent Stream 3           | 102           | 4            | 0.009        | Jurisdictional                        |
| Intermittent Stream 4           | 458           | 3            | 0.032        | Jurisdictional                        |
| Intermittent Stream 5           | 365           | 4.5          | 0.038        | Jurisdictional                        |
| Intermittent Stream 6           | 249           | 3.5          | 0.020        | Jurisdictional                        |
| Intermittent Stream Total       | 3,138         |              | 0.406        |                                       |
| Ephemeral Stream 1              | 84            | 1            | 0.002        | Non-Jurisdictional                    |
| Ephemeral Stream 2              | 289           | 2            | 0.013        | Non-Jurisdictional                    |
| Ephemeral Stream 3              | 21            | 1.5          | 0.001        | Non-Jurisdictional                    |
| Ephemeral Stream 4              | 412           | 2            | 0.019        | Non-Jurisdictional                    |
| Ephemeral Stream 5              | 175           | 1.5          | 0.006        | Non-Jurisdictional                    |
| Ephemeral Stream 6              | 94            | 2            | 0.004        | Non-Jurisdictional                    |
| Ephemeral Stream 7              | 26            | 2.5          | 0.001        | Non-Jurisdictional                    |
| Ephemeral Stream 8              | 38            | 1.5          | 0.001        | Non-Jurisdictional                    |
| Ephemeral Stream 9              | 111           | 1.5          | 0.004        | Non-Jurisdictional                    |
| Ephemeral Stream 10             | 120           | 1.5          | 0.004        | Non-Jurisdictional                    |
| Ephemeral Stream 11             | 169           | 1.5          | 0.006        | Non-Jurisdictional                    |
| Ephemeral Stream 12             | 97            | 1            | 0.002        | Non-Jurisdictional                    |
| Ephemeral Stream 13             | 76            | 1.5          | 0.003        | Non-Jurisdictional                    |
| Ephemeral Stream 14             | 139           | 1.5          | 0.005        | Non-Jurisdictional                    |
| Ephemeral Stream 15             | 81            | 1.5          | 0.003        | Non-Jurisdictional                    |
| Ephemeral Stream 16             | 167           | 1.5          | 0.006        | Non-Jurisdictional                    |
| Ephemeral Stream 17             | 120           | 1            | 0.003        | Non-Jurisdictional                    |
| Ephemeral Stream 18             | 65            | 1.5          | 0.002        | Non-Jurisdictional                    |
| Ephemeral Stream 19             | 45            | 2            | 0.002        | Non-Jurisdictional                    |
| Ephemeral Stream 20             | 95            | 2            | 0.004        | Non-Jurisdictional                    |
| Ephemeral Stream 21             | 21            | 1            | 0.000        | Non-Jurisdictional                    |
| Ephemeral Stream 22             | 31            | 2            | 0.001        | Non-Jurisdictional                    |
| Ephemeral Stream 23             | 135           | 1.5          | 0.005        | Non-Jurisdictional                    |
| Ephemeral Stream Total          | 2,611         |              | 0.097        |                                       |
| Open Water 1                    |               |              | 0.716        | Jurisdictional                        |
| Jurisdictional Open Water Total | ***           | ===          | 0.716        |                                       |
| Jurisdictional Features Total   | 3,138         |              | 1.122        |                                       |

FIGURES

Pianning & Design

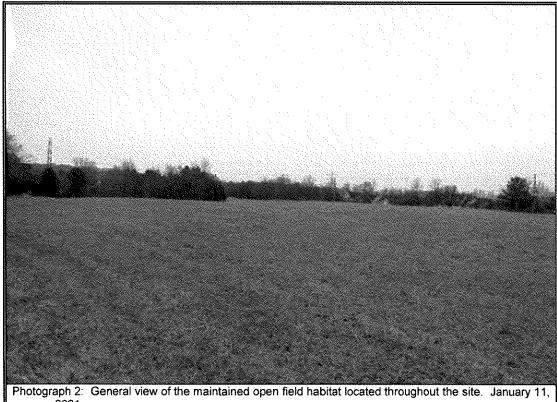
21-20NE-00016



# **PHOTOGRAPHS**



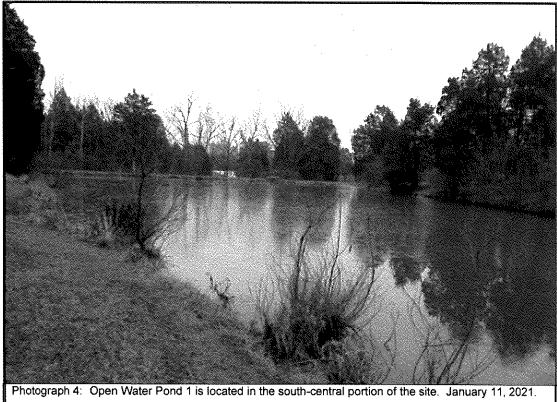
Photograph 1: General view of the upland mixed-age woods found throughout the site. This habitat is dominated by trees/shrubs such as white oak, bush honeysuckle, eastern red cedar. January 11, 2021.



Photograph 2: General view of the maintained open field habitat located throughout the site. January 11, 2021.



Photograph 3: General view of the old field habitat located throughout the site. January 11, 2021.





Photograph 5: Downstream view of Ephemeral Stream 11. This is a representative view of the on-site ephemeral streams. These streams did not have flowing water at the time of the field assessment. January 11, 2021.



Photograph 6: Downstream view of Intermittent Stream 2 in the central portion of the site. Downstream waters continue off site and flow under I-265 and into Shinks Branch. January 11, 2021.

# APPENDIX A WETLAND DETERMINATION DATA FORMS

|  | #11                                     | <b>.</b>                                |           | Dominance Test Worksheet   |
|--|---|---|-----------|--|
| Tree Stratum Plot Size (30')                 | Absolute %<br>Cover                     | Dominant                                | Indicator |  |
|  | Cover                                   | Species                                 | Status    | Number of Dominant Species   |
| 1  |   |   |           | that are OBL, FACW, or FAC: 0 (A)  |
| 2  |   |   |           | Total Number of Dominant   |
| 3  |   |   |           | Species Across ali Strata: 3 (B)   |
| 4  |   |   |           |  |
| 5  |   |   |           |  |
| 6  |   |   |           | Percent of Dominant Species  |
| "  |   |   | -         | that are OBL, FACW, or FAC: 0.00% (A/B)  |
| 7  |   |   |           |  |
| 8  |   |   |           | Prevalence Index Worksheet   |
| 9  |   |   |           | Total % Cover of:  |
| 10   |   |   |           | OBL species x 1 =  |
|  | 0 ==                                    | Total Cover                             |           | FACW species x 2 =   |
|  |   |   |           | FAC species x 3 =  |
| Sapling/Shrub                                | Absolute %                              | Dominant                                | Indicator | FACU species x 4 =   |
| Stratum Plot Size (15')                      | Cover                                   | Species                                 | Status    |  |
| 1  |   |   |           | UPL species x 5 =  |
|  |   |   |           | Column totals (A) (B)  |
| 2  |   |   |           | Prevalence Index = B/A =   |
| 3  |   |   |           |  |
| 4  |   |   |           |  |
| 5  |   |   |           | Hydrophytic Vegetation Indicators:   |
| 6  |   | *************************************** |           | 1 - Rapid test for hydrophytic vegetation  |
| 7  |   |   |           |  |
| 8  |   | <del></del>                             |           | 2 - Dominance test is >50%   |
| ***************************************      | *************************************** |   |           | 3 - Prevalence index is ≤3.0*  |
| 9  |   |   |           | 4 - Morphological adaptations* (provide  |
| 10   |   |   |           | supporting data in Remarks or on a   |
|  | 0 =                                     | Total Cover                             |           | separate sheet)  |
|  |   |   |           | Problematic hydrophytic vegetation*  |
|  | Absolute %                              | Dominant                                | Indicator | (explain)  |
| Herb Stratum Plot Size (5')                  | Cover                                   | Species                                 | Status    | (OAPIGIT)  |
| 1 Schedonorus arundinaceus                   | 40                                      | Yes                                     | FACU      | *Indicators of hydric soil and wetland   |
|  | *************************************** |   |           | hydrology must be present, unless  |
| 2 Setaria faberi                             | 20                                      | Yes                                     | UPL       | disturbed or problematic   |
| 3 Sorghum halepense                          | 20                                      | Yes                                     | FACU      |  |
| 4 Setaria pumila                             | 10                                      | No                                      | FAC       |  |
| 5  |   |   |           | Definitions of Four Vegetation Strata  |
| 6  |   |   |           | •  |
| 7  |   |   |           |  |
| 8  |   |   |           |  |
|  |   |   |           |  |
| 9  |   |   |           | The Mark of the Co.  |
| 10   |   |   |           | Tree - Woody plants 3 in. (7.6 cm) or more in diameter at  |
| 11   |   |   |           | breast height (DBH), regardless of height.   |
| 12   |   | *****                                   |           | Sanling/objects Monday stants less than 3 in DOLL and  |
| 13   |   |   |           | Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  |
| 14   |   |   |           | greater than 5.20 ft (1 ff) tall.  |
|  |   |   |           | Herb - All herbaceous (non-woody) plants, regardless of size,  |
| 15   | ****                                    |   |           | and woody plants less than 3.28 ft tall.   |
|  | 90 =                                    | Total Cover                             |           | and woody planto less than 5.20 (Ctall.  |
|  |   |   |           | Woody vines - All woody vines greater than 3.28 ft in height.  |
| Woody Vine Stratum Plot Size (30')           | Absolute %                              | Dominant                                | Indicator | The same of the sa |
| Woody Vine Stratum Plot Size (30')           | Cover                                   | Species                                 | Status    |  |
| 1  |   |   |           |  |
| 2  | <del></del>                             |   | •         |  |
|  |   |   |           |  |
| 3  |   |   |           |  |
| 4  |   |   |           | Hydrophytic  |
| 5  |   |   |           | vegetation   |
|  | 0 =                                     | Total Cover                             |           | present? No  |
|  |   |   |           |  |
| Remarks: (Include photo numbers here or on a | a separate sheet)                       |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |
|  |   |   |           |  |

VEGETATION (Four Strata) -- Us cientific names of plants

Sampling Point: DP1

| SOIL   |                                  |   |   |  |                  |                         |                            | Sampling Point: DP1   |  |  |
|--|----------------------------------|---|---|--|------------------|-------------------------|----------------------------|---|--|--|
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
| Profile Descri   | ption: (Describe to              | the depth                               | needed to document                      | the indica                             | tor or conf      | irm the at              | sence of indicators.)      |   |  |  |
| Depth  | Matrix                           |   | Red                                     | lox Featu                              | es               |                         | Texture                    | Remarks   |  |  |
| (Inches)   | Color (moist)                    | %                                       | Color (moist) % Type <sup>1</sup>       |  | Loc <sup>2</sup> | rexture                 | Remarks                    |   |  |  |
| 0-6  | 2.5Y 3/3                         | 100                                     |   |  |                  |                         | silty clay                 |   |  |  |
| 6-14   | 10YR 4/3                         | 60                                      | 2.5Y 5/3                                | 40                                     | С                | М                       | silty clay                 |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   | 1                                      |                  |                         |                            |   |  |  |
|  |                                  |   |   |  | 1                |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         | <del></del>                |   |  |  |
| <sup>1</sup> Type: C≕Cor                                       | ncentration, D=Dep               | letion, RM=                             | Reduced Matrix, MS                      | =Masked                                | Sand Grai        | ins - <sup>2</sup> Loca | ition: PL=Lining, M=Matrix |   |  |  |
| Hydric Soil Ir   | ·····                            |   |   |  |                  |                         | Indicators for Proble      | matic Hydric Soils:   |  |  |
| -  |                                  |   |   |  |                  |                         |                            | •   |  |  |
| Hist   | isol (A1)                        |   | Dar                                     | k Surface                              | (S7)             |                         |                            | 2 cm Muck (A10) (MLRA 147)                                    |  |  |
|  | ic Epipedon (A2)                 |   | Poly                                    | value Be                               | low Surfac       | e (S9) (M               | LRA 147, 148)              | Coast Prairie Redox (A16)                                     |  |  |
|  | ck Histic (A3)                   |   |   |  | rface (S9)       |                         |                            | (MLRA 147, 148)   |  |  |
|  | rogen Sulfide (A4)               |   | ********                                |  | d Matrix (F      |                         | •                          | Piedmont Floodplain Soils (F19)                               |  |  |
|  | itified Layers (A5)              |   | *************************************** | leted Mat                              | •                | /                       |                            | (MLRA 136, 147)   |  |  |
| -  | n Muck (A10) (LRR                | N)                                      | ·                                       |  | Surface (F       | 6)                      |                            | Very Shallow Dark Surface (TF12)                              |  |  |
| Depleted Below Dark Surface (A11)  Depleted Dark Surface (A11) |                                  |   |   |  | •                | -                       | Other (Explain in Remarks) |   |  |  |
| · · · · · · · · · · · · · · · · · · ·                          | k Dark Surface (A                | ,                                       |   |  | ssions (F8       |                         | •                          |   |  |  |
| Commission   | dy Muck Mineral (S               | •                                       | *************************************** | -                                      | ese Masse        | -                       | RR N                       |   |  |  |
| ***************************************                        | RA 147, 148)                     |   |   | RA 136)                                |                  | , , ,                   |                            |   |  |  |
|  | dy Gley Matrix (S4)              | )                                       |   | ,                                      | ce (F13) (I      | MLRA 136                | 5, 122)                    |   |  |  |
|  | dy Redox (\$5)                   |   |   |  |                  |                         | MLRA 148)                  | *Indicators of hydrophytic vegetation                         |  |  |
|  | pped Matrix (S6)                 |   |   |  |                  |                         | A 127, 147)                | and wetland hydrology must be<br>present, unless disturbed or |  |  |
|  | . , ,                            |   |   |  | ·                | , ,                     | •                          | problematic   |  |  |
|  |                                  |   |   |  |                  |                         |                            | Francisco   |  |  |
| ·····  |                                  |   |   |  |                  | T                       |                            |   |  |  |
| Restrictive I  | aver (if observed):              |   |   |  |                  |                         |                            |   |  |  |
|  | Restrictive Layer (if observed): |   |   |  |                  | Hydric soil present? No |                            |   |  |  |
| Type:  | ·/·                              | *************************************** |   | ······································ | -                | , ny                    | and son present?           | No  |  |  |
| Depth (Inches  | Depth (inches):                  |   |   |  |                  |                         |                            |   |  |  |
| Remarks:   |                                  |   |   |  |                  | <u> </u>                |                            |   |  |  |
| Remarks.   |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |
|  |                                  |   |   |  |                  |                         |                            |   |  |  |

## WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

| Project/Site:       | Old Heady Property            |                              | City/County: L                | ouisvulle/Jefferson | Sampling I           | Date:              | 1/11/21                                 |
|---------------------|-------------------------------|------------------------------|-------------------------------|---------------------|----------------------|--------------------|---|
| Applicant/Owner:    | Sunshine Builders,            | LLC                          | •                             | State: Kentucky     |                      | Sampling Poi       | <del></del>                             |
| Investigator(s):    | R. Fangman/Z. Triplett        |                              |                               | Section, Towns      | hip, Range:          |                    |   |
| Landform (hillslog  | oe, terrace, etc.):           | terrace                      | Local relief (concave         |                     | none                 | Slope (%           | 6): 1                                   |
| Subregion (LRR o    | or MLRA) LRR N                | Lat.: 38.                    | 172253                        | Long.: -85.521867   |                      | Datum:             |   |
|                     |                               |                              | pes, severely eroded, very    | rocky               | NWI Clas             | sification:        |   |
| Are climatic/hydro  | ologic conditions of the site | typical for this time of the | year?                         | Yes (If no, e)      | kplain in remarks    | i)                 |   |
| Are vegetation      | , soil                        | , or hydrology               | significantly dist            | urbed?              | Are "normal c        | ircumstances"      |   |
| Are vegetation      | , soit                        | , or hydrology               | naturally probler             | matic?              | present?             |                    | Yes                                     |
|                     |                               |                              |                               |                     | (If needed, exp      | olain any answers  | in remarks)                             |
|                     |                               |                              |                               |                     |                      |                    |   |
| CLISABAADY          | OF EWOULOO                    |                              |                               |                     |                      |                    |   |
| SUMMARY             | OF FINDINGS                   |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
| Hydrophytic vege    |                               | No No                        | is the Sampled Area           | 1                   |                      |                    |   |
| Hydric soil preser  |                               | No                           | within a Wetland?             |                     |                      | 10                 |   |
| Wetland hydrolog    | gy present?                   | No                           |                               |                     |                      |                    |   |
| <u></u>             |                               |                              |                               |                     |                      |                    |   |
| i                   | n alternative procedures h    | ere or in a separate repor   | t.)                           |                     |                      |                    |   |
| Upland data point   | t                             |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
| HADDOLO             | <b>^</b>                      |                              |                               |                     |                      |                    |   |
| HYDROLOG            |                               |                              |                               |                     |                      |                    |   |
| Wetland Hy          | drology Indicators            |                              |                               |                     |                      |                    |   |
| Primary Indicators  | s (minimum of one is requi    | ired; check all that apply)  |                               | Seconda             | arv Indicators (m    | inimum of two rec  | wired\                                  |
|                     | · Water (A1)                  |                              | e Aquatic Plants (B14)        |                     | Surface Soil C       |                    | uned)                                   |
|                     | ater Table (A2)               |                              | frogen Sulfide Odor (C1)      | -                   |                      |                    | unfoco (DB)                             |
|                     | ion (A3)                      |                              |                               | na Poete (C3)       |                      | etated Concave S   | ипасе (вв)                              |
|                     | Marks (B1)                    |                              | dized Rhizospheres on Livi    | -                   | Drainage Patt        |                    |   |
|                     |                               |                              | sence of Reduced Iron (C4)    |                     | Moss Trim Lin        | , ,                |   |
|                     | ent Deposits (B2)             | **********                   | ent Iron Reduction in Tilled  | Soils (C6)          |                      | Vater Table (C2)   |   |
|                     | posits (B3)                   | Thi                          | n Muck Surface (C7)           |                     | Crayfish Burro       | ws (C8)            |   |
| Algal Mi            | at or Crust (B4)              | Oth                          | er (Explain in Remarks)       |                     | Saturation Vis       | ible on Aerial Ima | gery (C9)                               |
| Iron De             | posits (B5)                   |                              |                               |                     | Stunted or Str       | essed Plants (D1   | )                                       |
| Inundat             | ion Visible on Aerial Image   | ery (B7)                     |                               |                     | Geomorphic F         | osition (D2)       |   |
| Water-S             | Stained Leaves (B9)           |                              |                               |                     | Shallow Aquita       | ard (D3)           |   |
| Aquatic             | Fauna (B13)                   |                              |                               |                     |                      | phic Relief (D4)   |   |
| *                   | . ,                           |                              |                               |                     | FAC-Neutral 1        | , ,                |   |
|                     |                               |                              |                               | *******             |                      | CSI (DD)           |   |
| Field Observatio    | ens:                          |                              |                               |                     |                      |                    |   |
| Surface water pre   | esent? Yes                    | No                           | X Depth (inches):             | N/A                 | Mentania             |                    |   |
| Water table prese   | ent? Yes                      | No No                        | X Depth (inches):             | >14                 | Wetland<br>hydrology |                    |   |
| Saturation presen   |                               |                              | X Depth (inches):             | >14                 | present?             | No                 |   |
| (includes capillar) |                               |                              |                               |                     | presenti             |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
| Describe recorde    | d data (stream gauge, mo      | nitoring well, aerial photos | , previous inspections), if a | vailable:           |                      |                    | *************************************** |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
| Remarks:            |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
| ĺ                   |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |
|                     |                               |                              |                               |                     |                      |                    |   |

|   |   |             |   | Dominance Test Worksheet   |
|---|---|-------------|---|--|
| Tree Stratum Płot Size (30')            | Absolute %                              | Dominant    | Indicator                               |  |
| Title Statum Fiot Size (30 )            | Cover                                   | Species     | Status                                  | Must be of Builty (B. )  |
| 1 Juniperus virginiana                  | 40                                      | Yes         | FACU                                    | Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)   |
| 2 Ulmus americana                       | 30                                      | Yes         | FACW                                    | ***************************************  |
| 3 Fraxinus pennsylvanica                | <del></del>                             |             |   | Total Number of Dominant   |
|   | 15                                      | No.         | FACW                                    | Species Across all Strata: 5 (B)   |
| 4 <u>Betula nigra</u>                   | 10                                      | No          | FACW                                    |  |
| 5                                       |   |             |   | Percent of Dominant Species  |
| 6                                       |   |             |   | that are OBL, FACW, or FAC: 40.00% (A/B)   |
| 7                                       |   |             |   |  |
| 8                                       | ****                                    |             |   | Prevalence Index Worksheet   |
| 9                                       |   |             | <del></del>                             | Total % Cover of:  |
| 10                                      |   |             |   |  |
|   | ^^                                      | T-1-1-0     | ****                                    | OBL species x 1 =  |
|   | 95 ==                                   | Total Cover |   | FACW species x 2 =   |
|   |   |             |   | FAC species x 3 =  |
| Sapling/Shrub Plot Size (15')           | Absolute %                              | Dominant    | Indicator                               | FACU species x 4 =   |
| Stratum Fiot Size (15)                  | Cover                                   | Species     | Status                                  | UPL species x 5 ≂  |
| 1 Lonicera maackii                      | 60                                      | Yes         | UPL                                     | Column totals (A) (B)  |
| 2                                       |   |             | *************************************** | Prevalence Index = B/A =   |
| 3                                       |   |             |   | TOTAL STOCK OF THE |
| 4                                       | <del></del>                             |             |   |  |
|   |   |             |   |  |
| 5                                       |   |             |   | Hydrophytic Vegetation Indicators:   |
| 6                                       |   |             |   | 1 - Rapid test for hydrophytic vegetation  |
| 7                                       |   |             |   | 2 - Dominance test is >50%   |
| 8                                       |   |             |   | 3 - Prevalence index is ≤3.0*  |
| 9                                       |   |             |   | 4 - Morphological adaptations* (provide  |
| 10                                      |   |             |   | supporting data in Remarks or on a   |
|   | 60 =                                    | Total Cover |   | separate sheet)  |
|   |   | FOLAL COVEL |   |  |
|   |   |             |   | Problematic hydrophytic vegetation*  |
| Herb Stratum Plot Size (5')             | Absolute %                              | Dominant    | Indicator                               | (explain)  |
|   | Cover                                   | Species     | Status                                  | *Indicators of hydric soil and wetland   |
| 1 Lonicera maackii                      | 10                                      | Yes         | UPL                                     | hydrology must be present, unless  |
| 2 Carex blanda                          | 5                                       | Yes         | FAC                                     | disturbed or problematic   |
| 3 Euonymus fortunei                     | 3                                       | No          | UPL                                     |  |
| 4                                       |   |             |   |  |
| 5                                       |   |             |   | <b>L</b>   |
| -                                       |   | <u> </u>    |   | Definitions of Four Vegetation Strata  |
| 6                                       |   |             |   |  |
| 7                                       |   |             |   |  |
| 8                                       |   |             |   |  |
| 9                                       |   |             | *************************************** |  |
| 10                                      |   |             |   | Tree - Woody plants 3 in. (7.6 cm) or more in diameter at  |
| 11                                      |   | ····        |   | breast height (DBH), regardless of height.   |
|   | *************************************** |             | *************************************** |  |
| 12                                      |   | *****       |   | Sapling/shrub - Woody plants less than 3 in. DBH and   |
| 13                                      |   |             |   | greater than 3.28 ft (1 m) tall.   |
| 14                                      |   |             |   |  |
| 15                                      |   |             |   | Herb - All herbaceous (non-woody) plants, regardless of size,  |
|   | 18 =                                    | Total Cover |   | and woody plants less than 3.28 ft tall.   |
|   |   |             |   |  |
|   | A41-1-04                                | B           |   | Woody vines - All woody vines greater than 3.28 ft in height.  |
| Woody Vine Stratum Plot Size (30')      | Absolute %                              | Dominant    | Indicator                               |  |
|   | Cover                                   | Species     | Status                                  |  |
| 1                                       |   |             |   |  |
| 2                                       |   |             |   |  |
| 3                                       |   |             |   |  |
| 4                                       |   |             |   |  |
| 5                                       | <del></del>                             |             |   | Hydrophytic  |
| ×                                       |   |             |   | vegetation   |
|   | 0 =                                     | Total Cover |   | present? No  |
|   |   |             |   |  |
| Remarks: (Include photo numbers here of | or on a separate sheet)                 |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |
|   |   |             |   |  |

VEGETATION (Four Strata) -- Us cientific names of plants

Sampling Point: DP2

| SOIL                     |                     |               |                      |   |                   |                        |                            | Sampling Point: DP2                    |
|--------------------------|---------------------|---------------|----------------------|---|-------------------|------------------------|----------------------------|--|
| Osefila Danasi           | -Man. (Danasiba ta  | ale e de cale |                      |   |                   |                        |                            |  |
|                          |                     | the depth i   | needed to document t |   |                   | rm the at              | osence of indicators.)     |  |
| Depth                    | Matrix              |               |                      | x Featur                                |                   | 2                      | Texture                    | Remarks                                |
| (Inches)                 | Color (moist)       | %             | Color (moist)        | %                                       | Type <sup>1</sup> | Loc <sup>2</sup>       |                            |  |
| 0-4                      | 10YR 4/3            | 100           |                      |   | ļ                 |                        | silty clay loam            |  |
| 4-14                     | 2.5Y 6/4            | 100           |                      |   |                   | <u></u>                | silty clay loam            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
| <sup>1</sup> Type: C=Con | centration, D≃Depl  | etion, RM=    | Reduced Matrix, MS=  | Masked                                  | Sand Grain        | ns - <sup>2</sup> Loca | ation: PL=Lining, M=Matrix |  |
| Hydric Soil In           | dicators:           |               |                      |   |                   |                        | Indicators for Problem     | natic Hydric Soils:                    |
|                          |                     |               |                      |   |                   |                        |                            |  |
| Hìsti                    | sol (A1)            |               | Dark                 | Surface                                 | (S7)              |                        |                            | 2 cm Muck (A10) (MLRA 147)             |
| Histi                    | c Epipedon (A2)     |               | Poly                 | /alue Bel                               | ow Surface        | e (S9) <b>(M</b>       | LRA 147, 148)              | Coast Prairie Redox (A16)              |
| Blac                     | k Histic (A3)       |               |                      |   | face (S9)         |                        |                            | (MLRA 147, 148)                        |
| ***********              | rogen Sulfide (A4)  |               |                      |   | Matrix (F:        |                        | •                          | Piedmont Floodplain Soils (F19)        |
|                          | tified Layers (A5)  |               |                      | eted Matr                               | -                 | -,                     |                            | (MLRA 136, 147)                        |
|                          | Muck (A10) (LRR     | N)            |                      |   | urface (F6        | .)                     |                            | Very Shallow Dark Surface (TF12)       |
|                          | leted Below Dark S  |               | Militari minerary    |   | k Surface (       | •                      |                            | Other (Explain in Remarks)             |
|                          | k Dark Surface (A1  |               |                      |   | ssions (F8)       |                        | _                          | Obser (Explain in Remarks)             |
| -                        | dy Muck Mineral (S  |               | -                    | -                                       | se Masses         |                        | RR N                       |  |
| -                        | RA 147, 148)        | ., (          | -                    | A 136)                                  |                   | · () 12/ (=            | 3414 I <b>4</b>            |  |
|                          | dy Gley Matrix (S4) |               |                      |   | ce (F13) (N       | B D A 434              | . 400)                     |  |
|                          | dy Redox (S5)       |               |                      |   |                   |                        | , 122)<br>(MLRA 148)       | *Indicators of hydrophytic vegetation  |
|                          | pped Matrix (S6)    |               |                      |   |                   |                        |                            | and wetland hydrology must be          |
| Strip                    | pped Matrix (56)    |               | Kea                  | Parent M                                | atenai (F2        | 1) (MLR                | A 127, 147)                | present, unless disturbed or           |
|                          |                     |               |                      |   |                   |                        |                            | problematic                            |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
| Restrictive La           | yer (if observed):  |               |                      |   |                   |                        |                            |  |
| Туре:                    |                     |               |                      |   |                   | Ну                     | dric soil present?         | No                                     |
| Depth (inches)           | ):                  |               |                      | · · · · · · · · · · · · · · · · · · ·   | *                 | _                      | •                          | ······································ |
|                          |                     |               |                      |   |                   |                        |                            |  |
| Remarks:                 |                     |               |                      | *************************************** |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            | ;                                      |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |
|                          |                     |               |                      |   |                   |                        |                            |  |

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

| Project/Site: Old Heady Property                  | !                                | City/County: L                      | ouisvulle/Jefferson                     | Sampling Date:            | 1/11/2          | 21                                      |
|---|----------------------------------|-------------------------------------|---|---------------------------|-----------------|---|
| Applicant/Owner: Sunshine Build                   | lers, LLC                        |                                     | State: Kentucky                         | Sampl                     | ing Point:      | DP3                                     |
| nvestigator(s): R. Fangman/Z. Trip                | lett                             |                                     | Section, Townsh                         | ip, Range:                |                 |   |
| andform (hillslope, terrace, etc.):               | terrace                          | Local relief (concave               | , convex, none):                        | none S                    | Slope (%):      | 3                                       |
| ubregion (LRR or MLRA) LRR                        |                                  |                                     | Long.: -85,522690                       | Datum;                    |                 |   |
| oil Map Unit Name: ShD3 - Shrouts                 |                                  |                                     |   | NWI Classification:       |                 |   |
| re climatic/hydrologic conditions of th           |                                  |                                     | *************************************** | olain in remarks)         |                 |   |
| re vegetation, soil, soil, soil, soil, soil, soil | , or hydrology<br>, or hydrology | significantly dist                  |   | Are "normal circumstance  | ces"            |   |
| , son   | , or rivarology                  | naturally proble                    | matic?                                  | present?                  |                 | Yes                                     |
|   |                                  |                                     |   | (If needed, explain any a | nswers in rem   | arks)                                   |
|   |                                  |                                     |   |                           |                 |   |
| SUMMARY OF FINDINGS                               |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   | <del>W.</del>             |                 |   |
| ydrophytic vegetation present?                    | No                               | Is the Sampled Are                  | -                                       |                           |                 |   |
| lydric soil present?                              | No                               | within a Wetland?                   | d.                                      | No                        |                 |   |
| /etland hydrology present?                        | No                               | 777                                 |   |                           |                 |   |
|   |                                  | 1                                   |   |                           |                 |   |
| emarks: (Explain alternative procedu              | res here or in a separate repor  | rt.)                                |   |                           |                 |   |
| pland data point                                  |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
| IYDROLOGY   |                                  |                                     |   |                           |                 | *************************************** |
|   |                                  |                                     |   |                           |                 |   |
| Wetland Hydrology Indicators                      |                                  |                                     |   |                           |                 |   |
| imary Indicators (minimum of one is               | required; check all that apply)  |                                     | Secondar                                | y Indicators (minimum of  | two required)   |   |
| Surface Water (A1)                                | Tn.                              | e Aquatic Plants (B14)              |   | Surface Soil Cracks (B6)  | )               |   |
| High Water Table (A2)                             |                                  | drogen Sulfide Odor (C1)            |   | Sparsely Vegetated Con    | cave Surface    | (B8)                                    |
| Saturation (A3)                                   | Oxi                              | idized Rhizospheres on Livi         | ng Roots (C3)                           | Drainage Patterns (B10)   | ı               |   |
| Water Marks (B1)                                  | Pre                              | esence of Reduced Iron (C4          | )                                       | Moss Trim Lines (B16)     |                 |   |
| Sediment Deposits (B2)                            | Re                               | cent Iron Reduction in Tilled       | Soils (C6)                              | Dry-Season Water Table    | ∍ (C2)          |   |
| Drift Deposits (B3)                               | Thi                              | in Muck Surface (C7)                |   | Crayfish Burrows (C8)     |                 |   |
| Algal Mat or Crust (B4)                           | Oth                              | ner (Explain in Remarks)            |   | Saturation Visible on Aer | rial Imagery (C | 29)                                     |
| Iron Deposits (B5)                                |                                  |                                     |   | Stunted or Stressed Plan  | nts (D1)        |   |
| Inundation Visible on Aerial I                    | magery (87)                      |                                     |   | Geomorphic Position (D2   | 2)              |   |
| Water-Stained Leaves (B9)                         |                                  |                                     |   | Shallow Aquitard (D3)     |                 |   |
| Aquatic Fauna (B13)                               |                                  |                                     |   | Microtopographic Relief   | (D4)            |   |
|   |                                  |                                     |   | FAC-Neutral Test (D5)     |                 |   |
| inld Observations                                 |                                  |                                     |   |                           |                 |   |
| eld Observations:<br>urface water present? Ye     | se No                            | Y Donth (inches)                    | A1/A                                    |                           |                 |   |
| fater table present?                              | <del></del>                      | X Depth (inches):                   | N/A                                     | Wetland                   |                 |   |
| aturation present?                                | <del></del>                      | X Depth (inches): X Depth (inches): | >14                                     | hydrology                 | 1-              |   |
| ncludes capillary fringe)                         | 5 NO                             | X Deptil (inches):                  | >14                                     | present? N                | 0               |   |
| oudes capitally milige)                           |                                  |                                     |   |                           |                 |   |
| escribe recorded data (stream gauge               | monitoring well aerial photo:    | s previous inspections) if a        | vailable:                               |                           |                 |   |
|   | , , , , , ,                      | s, protiono mopocacios, il u        | Taliabic.                               |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
| lemarks:  |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |
|   |                                  |                                     |   |                           |                 |   |

|  |                   |   |   | Dominance Test Worksheet                                      |
|--|-------------------|---|---|---|
| Tree Stratum Plot Size (30')                 | Absolute %        | Dominant                                | Indicator                               |   |
| 112121212111 (00)                            | Cover             | Species                                 | Status                                  | Number of Dominant Species                                    |
| 1 Juniperus virginiana                       | 40                | Yes                                     | FACU                                    | that are OBL, FACW, or FAC: 2 (A)                             |
| 2 Fraxinus pennsylvanica                     | 20                | Yes                                     | FACW                                    | · · · · · · · · · · · · · · · · · · ·                         |
| 3 Juglans nigra                              | 20                | Yes                                     | FACU                                    | Total Number of Dominant                                      |
|  | 20                | 165                                     | FACU                                    | Species Across all Strata: 7 (B)                              |
| 4  |                   |   |   |   |
| 5  |                   |   |   | Percent of Dominant Species                                   |
| 6  |                   |   |   | that are OBL, FACW, or FAC: 28.57% (A/B)                      |
| 7  |                   |   | *************************************** | · /   |
| 8  |                   | •                                       | *************************************** | Prevalence Index Worksheet                                    |
| 9  |                   |   |   | •   |
|  |                   |   | *************************************** | Total % Cover of:   |
| 10   |                   |   |   | OBL species x 1 =   |
|  | = 08              | Total Cover                             |   | FACW species x 2 =  |
|  |                   |   |   | FAC species x 3 =   |
| Sapling/Shrub                                | Absolute %        | Dominant                                | Indicator                               | FACU species x 4 =  |
| Stratum Plot Size (15')                      | Cover             | Species                                 | Status                                  |   |
|  |                   |   | *************************************** |   |
|  | 40                | Yes                                     | UPL                                     | Column totals (A) (B)   |
| 2 Comus florida                              | 10                | Yes                                     | FACU                                    | Prevalence Index = B/A =                                      |
| 3  |                   |   |   |   |
| 4  |                   |   |   |   |
| 5  |                   | *************************************** |   | Hydrophytic Vegetation Indicators:                            |
| 6  |                   |   |   |   |
|  |                   |   |   | 1 - Rapid test for hydrophytic vegetation                     |
| 7  |                   |   |   | 2 - Dominance test is >50%                                    |
| 8  |                   |   |   | 3 - Prevalence index is ≤3.0*                                 |
| 9  |                   |   |   | 4 - Morphological adaptations* (provide                       |
| 10   |                   |   | -                                       | supporting data in Remarks or on a                            |
|  | 50 =              | Total Cover                             |   | separate sheet)   |
|  |                   | 10141 00101                             |   |   |
|  |                   |   |   | Problematic hydrophytic vegetation*                           |
| Herb Stratum Plot Size (5')                  | Absolute %        | Dominant                                | Indicator                               | (explain)   |
|  | Cover             | Species                                 | Status                                  | *Indicators of hydric soil and wetland                        |
| 1 Glechoma hederacea                         | 20                | Yes                                     | FACU                                    | hydrology must be present, unless                             |
| 2 Microstegium vimineum                      | 20                | Yes                                     | FAC                                     | disturbed or problematic                                      |
| 3 Carex blanda                               | 10                | No                                      | FAC                                     |   |
| 4 Ligustrum sinense                          | 10                |   | <del></del>                             |   |
|  | IV                | No                                      | <u>FACU</u>                             |   |
| 5  |                   | ****                                    |   | Definitions of Four Vegetation Strata                         |
| 6  |                   |   |   |   |
| 7  |                   |   |   |   |
| 8  |                   |   | *************************************** |   |
| 9  |                   | *************************************** |   |   |
| 10   |                   |   |   | Tree - Woody plants 3 in. (7.6 cm) or more in diameter at     |
|  |                   |   |   | breast height (DBH), regardless of height.                    |
| 11   |                   |   |   | broder norghic (BBH), regardless of fleight.                  |
| 12   |                   |   |   | Sapling/shrub - Woody plants less than 3 in. DBH and          |
| 13   |                   |   |   | greater than 3.28 ft (1 m) tall.                              |
| 14   |                   | <del></del>                             |   | State that size it (1 m) tall.                                |
|  |                   |   |   | Herb - All herbaceous (non-woody) plants, regardless of size, |
| 15   |                   | *************************************** |   | and woody plants less than 3.28 ft tail.                      |
|  | 60 =              | Total Cover                             |   | ,,  |
|  |                   |   |   | Woody vines - All woody vines greater than 3.28 ft in height. |
| Woody Vine Stratum Plot Size (30')           | Absolute %        | Dominant                                | Indicator                               | ,   |
| Plot Size (30)                               | Cover             | Species                                 | Status                                  |   |
| 1  |                   |   |   |   |
| 2  |                   |   |   |   |
|  |                   |   |   |   |
| 3  |                   |   |   |   |
| 4  |                   |   |   | Hydrophytic   |
| 5  |                   |   |   | vegetation  |
|  | 0 =               | Total Cover                             |   | present? No   |
|  |                   |   |   |   |
| Remarks: (Include photo numbers here or on   | a senarate cheet\ |   |   |   |
| conditos, (include prioto numbers here of on | a separate sneet) |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |
|  |                   |   |   |   |

VEGETATION (Four Strata) -- Us cientific names of plants

Sampling Point: DP3

| SOIL                                    |  | ···         | :                                     |                        |                   |                        | ź.                         | Sampling Point: DP3                                |  |  |
|---|--|-------------|---------------------------------------|------------------------|-------------------|------------------------|----------------------------|--|--|--|
| Profile Decorie                         | ation: (Decaribo to  | the danth   | needed to document t                  | ha jadin               | lar ar            | ا سالة مسا             |                            |  |  |  |
| Depth                                   | Matrix   | the depth   |                                       | ne indica<br>ox Featur |                   | im the at              | sence of indicators.)      |  |  |  |
| (Inches)                                | Color (moist)  | %           | Color (moist)                         | %                      | Type <sup>1</sup> | Loc <sup>2</sup>       | Texture                    | Remarks  |  |  |
| 0-4                                     | 10YR 4/3   | 100         |                                       |                        |                   |                        | silty clay                 |  |  |  |
| 4-14                                    | 10YR 5/4   | 100         |                                       |                        |                   |                        | silty clay                 |  |  |  |
| ,                                       |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             | · · · · · · · · · · · · · · · · · · · |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   | ļ                      |                            |  |  |  |
|   |  |             |                                       |                        | <u> </u>          |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   | <u> </u>               |                            |  |  |  |
|   |  | <u> </u>    |                                       |                        |                   |                        | <u> </u>                   |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  | letion, RM= | Reduced Matrix, MS=                   | Masked                 | Sand Grai         | ns - <sup>2</sup> Loca | ation: PL≃Lining, M=Matrix |  |  |  |
| lydric Soil In                          | dicators:  |             |                                       |                        |                   |                        | Indicators for Proble      | matic Hydric Soils:                                |  |  |
|   |  |             |                                       | _                      |                   |                        |                            |  |  |  |
|   | sol (A1)   |             |                                       | Surface                |                   | - (00) 486             |                            | 2 cm Muck (A10) (MLRA 147)                         |  |  |
|   | c Epipedon (A2)  |             |                                       |                        |                   |                        | LRA 147, 148)              | Coast Prairie Redox (A16)                          |  |  |
|   | Black Histic (A3) Thin Dark Surface ( Hydrogen Sulfide (A4) Loarny Gleyed Matr         |             |                                       |                        |                   |                        | 41, 140)                   | (MLRA 147, 148)<br>Piedmont Floodplain Soils (F19) |  |  |
|   | Hydrogen Suffide (A4) Loarny Gleyed Matrix Stratified Layers (A5) Depleted Matrix (F3) |             |                                       |                        |                   |                        |                            | (MLRA 136, 147)                                    |  |  |
| -                                       | Muck (A10) (LRR  | N)          |                                       |                        | urface (F6        | 5)                     |                            | Very Shallow Dark Surface (TF12)                   |  |  |
| Depl                                    | leted Below Dark S   | Surface (A1 |                                       |                        | Surface           | •                      | -                          | Other (Explain in Remarks)                         |  |  |
| Thic                                    | k Dark Surface (A  | 12)         | Redo                                  | ox Depres              | sions (F8         | )                      |                            | , ,  |  |  |
|   | dy Muck Mineral (S   | (LRR,N      | Iron-                                 | Mangane                | se Masse          | s (F12) <b>(</b> L     | RR N                       |  |  |  |
| -                                       | (A 147, 148)   |             |                                       | A 136)                 |                   |                        |                            |  |  |  |
|   | dy Gley Matrix (S4)  | <b>)</b>    |                                       |                        | æ (F13) (N        |                        |                            | *Indicators of hydrophytic vegetation              |  |  |
|   | dy Redox (S5)  |             |                                       |                        |                   |                        | MLRA 148)                  | and wetland hydrology must be                      |  |  |
| Suip                                    | ped Matrix (S6)  |             | Red                                   | Parent IVI             | atenai (F.        | 21) ( <b>IVIL.R</b> .  | A 127, 147)                | present, unless disturbed or                       |  |  |
|   |  |             |                                       |                        |                   |                        |                            | problematic  |  |  |
| *************************************** |  |             |                                       |                        |                   |                        |                            |  |  |  |
| estrictive La                           | yer (if observed):   | :           |                                       |                        |                   |                        |                            |  |  |  |
| ype:                                    |  |             |                                       |                        |                   | Hv                     | dric soil present?         | No   |  |  |
| epth (inches)                           | ):   |             |                                       |                        | •                 | ,                      | arra dan product.          |  |  |  |
|   |  |             |                                       |                        | •                 |                        |                            |  |  |  |
| emarks:                                 |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |
|   |  |             |                                       |                        |                   |                        |                            |  |  |  |

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

| Project/Site: _C     | Old Heady Property          |                              | City/County: L                         | ouisvulle/Jefferson | Sampling [        | Date: 1/11.                             | /21                                     |
|----------------------|-----------------------------|------------------------------|--|---------------------|-------------------|---|---|
| Applicant/Owner:     | Sunshine Builders, L        | LC                           |  | State: Kentucky     |                   | Sampling Point:                         | DP4                                     |
| nvestigator(s): F    | R. Fangman/Z. Triplett      |                              |  | Section, Townsl     | nip, Range:       | , <u>, ,</u>                            | ·                                       |
| Landform (hillslope, | , terrace, etc.):           | terrace                      | Local relief (concave                  |                     | concave           | Slope (%):                              | 0                                       |
| Subregion (LRR or    | MLRA) LRR N                 | Lat.: 38.                    | 170497                                 | Long.: -85,519718   |                   | Datum:                                  |   |
| Soil Map Unit Name   | e: ShD3 - Shrouts silt k    | pam, 12 to 25 percent sic    | pes, severely eroded, very             | rocky               | NWI Clas          | *************************************** | *************************************** |
| Are climatic/hydrolo | ogic conditions of the site | typical for this time of the | e year?                                | Yes (If no, ex      | plain in remarks  | )                                       |   |
| Are vegetation _     | , soil                      | , or hydrology               | significantly dist                     | urbed?              | Are "normal ci    | rcumstances"                            |   |
| Are vegetation       | , soil                      | , or hydrology               | naturally proble                       | matic?              | present?          |   | Yes                                     |
|                      |                             |                              |  |                     | (If needed, exp   | lain any answers in re                  | narks)                                  |
|                      |                             |                              |  |                     |                   |   |   |
| 01188888             | SE EINIDINGO                |                              |  |                     |                   |   |   |
| SUMMARY              | OF FINDINGS                 |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
| lydrophytic vegeta   | tion present?               | No                           | Is the Sampled Are                     | 5                   |                   |   |   |
| lydric soil present? | ?                           | No                           | within a Wetland?                      | •                   | ١                 | lo                                      |   |
| Vetland hydrology    | present?                    | No                           |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
| :emarks: (Explain    | alternative procedures he   | re or in a separate repor    | t.)                                    |                     |                   |   |   |
| lpland data point    |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              | ······································ |                     |                   |   |   |
| IYDROLOG'            | Υ                           |                              |  |                     |                   |   |   |
| Wetland Hydr         | ology Indicators            |                              |  |                     |                   |   | *************************************** |
| •                    |                             |                              |  |                     |                   |   |   |
|                      | (minimum of one is requir   |                              |  | Seconda             | ary Indicators (m | nimum of two required                   | )                                       |
| Surface V            | Vater (A1)                  | Tru                          | e Aquatic Plants (814)                 |                     | Surface Soil C    | racks (B6)                              |   |
| High Wat             | er Table (A2)               | Hyd                          | drogen Sulfide Odor (C1)               |                     | Sparsely Vege     | tated Concave Surfac                    | e (B8)                                  |
| Saturation           | n (A3)                      | Ox                           | dized Rhizospheres on Livi             | ng Roots (C3)       | Drainage Patt     | ems (B10)                               |   |
| Water Ma             | arks (B1)                   | Pre                          | sence of Reduced Iron (C4              | )                   | Moss Trim Lin     | es (B16)                                |   |
| Sediment             | Deposits (B2)               | Re                           | cent Iron Reduction in Tilled          | I Soils (C6)        | Dry-Season W      | /ater Table (C2)                        |   |
| Drift Depo           | osits (B3)                  | Thi                          | n Muck Surface (C7)                    |                     | Crayfish Burro    | ws (C8)                                 |   |
| Algal Mat            | or Crust (B4)               | Oth                          | er (Explain in Remarks)                |                     | Saturation Vis    | ible on Aerial Imagery                  | (C9)                                    |
| Iron Depo            | osits (B5)                  |                              |  |                     |                   | essed Plants (D1)                       | , ,                                     |
| Inundation           | n Visible on Aerial Image   | ry (B7)                      |  | *******             | Geomorphic P      |   |   |
| Water-Sta            | ained Leaves (B9)           |                              |  |                     | Shallow Aquit     | · ·                                     |   |
| Aquatic F            | auna (B13)                  |                              |  |                     |                   | hic Relief (D4)                         |   |
|                      | • •                         |                              |  | ********            | FAC-Neutral 1     |   |   |
|                      |                             |                              |  |                     |                   | ()                                      |   |
| eld Observation      | s:                          |                              |  |                     |                   |   |   |
| urface water prese   |                             | No                           | X Depth (inches):                      | N/A                 |                   |   |   |
| Vater table present  | ***                         | No No                        | X Depth (inches):                      | >14                 | Wetland           |   |   |
| aturation present?   |                             | No                           |  |                     | hydrology         | *1-                                     |   |
| ncludes capillary f  |                             | INC.                         | X Depth (inches):                      | >14                 | present?          | No No                                   |   |
| icidues capillary ii | (inge)                      |                              |  |                     |                   |   |   |
|                      | d.t. /-t                    | Mf                           |  |                     |                   |   |   |
| escribe recorded     | data (stream gauge, mon     | itoring well, aeriai photos  | s, previous inspections), if a         | vailable:           |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
| Remarks:             |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |
|                      |                             |                              |  |                     |                   |   |   |

|        |  |   |   |  |   | Dominance Test Worksheet   |
|--------|--|---|---|--|---|--|
| ۳ ا    | ree Stratum                            | Plot Size (30')                         | Absolute %                              | Dominant                                     | Indicator                               |  |
| -      | TOO OCCURRENT                          | 1 101 0120 (00)                         | Cover                                   | Species                                      | Status                                  | Number of Dominant Species   |
| 1      |  |   |   |  |   | that are OBL, FACW, or FAC: 0 (A)  |
| 2      |  |   | WWW                                     | <del></del>                                  | <del></del>                             | · · · · · · · · · · · · · · · · · · ·  |
| 3      |  |   |   |  | Y                                       | Total Number of Dominant   |
| -      |  |   |   |  |   | Species Across all Strata: 1 (B)   |
| 4      |  |   |   |  |   |  |
| 5      |  |   |   |  |   | Percent of Dominant Species  |
| 6      |  |   |   |  |   | that are OBL, FACW, or FAC: 0.00% (A/B)  |
| 7 -    |  |   |   |  |   | (705)  |
| -      |  |   |   |  |   |  |
| 8_     |  | ***                                     |   |  |   | Prevalence Index Worksheet   |
| 9_     |  |   |   |  |   | Total % Cover of:  |
| 10     |  |   |   |  |   | OBL species x 1 =  |
| _      |  |   | 0 =                                     | Total Cover                                  |   |  |
|        |  |   |   | TOTAL COVE                                   |   |  |
| _      |  |   |   |  |   | FAC species x3 =   |
| S      | apling/Shrub                           | Plot Size (15')                         | Absolute %                              | Dominant                                     | Indicator                               | FACU species x 4 =   |
|        | Stratum                                |   | Cover                                   | Species                                      | Status                                  | UPL species x 5 =  |
| 1      |  |   |   |  |   | Column totals (A) (B)  |
| 2-     | ······                                 |   |   |  | *****                                   | Prevalence Index = B/A =   |
|        | ······································ |   |   |  |   | Frevalence index = 5/A =   |
| 3      |  |   |   |  |   |  |
| 4      |  |   |   |  |   |  |
| 5      |  |   |   |  |   | Hydrophytic Vegetation Indicators:   |
| 6      | ***                                    |   |   |  |   | - · · ·  |
|        | ······································ |   |   |  |   | 1 - Rapid test for hydrophytic vegetation  |
| 7      |  |   |   |  |   | 2 - Dominance test is >50%   |
| 8_     |  |   |   |  |   | 3 - Prevalence index is ≤3.0*  |
| 9      |  |   |   |  |   | 4 - Morphological adaptations* (provide  |
| 10     |  |   |   |  |   | supporting data in Remarks or on a   |
|        |  |   | 0 ==                                    | Tatal Carre                                  | <del></del>                             | separate sheet)  |
|        |  |   |   | Total Cover                                  |   |  |
|        |  |   |   |  |   | Problematic hydrophytic vegetation*  |
| li     | erb Stratum                            | Diet Cine (61)                          | Absolute %                              | Dominant                                     | Indicator                               | (explain)  |
| 13     | eib Stratum                            | Plot Size (5')                          | Cover                                   | Species                                      | Status                                  |  |
| 1      | Schedonorus aru                        | ndinacque                               | 80                                      | Yes  | FACU                                    | *Indicators of hydric soil and wetland   |
| ****   |  | namaceas                                |   |  |   | hydrology must be present, unless  |
| 2_     | Carex blanda                           |   | 10                                      | No   | FAC                                     | disturbed or problematic   |
| 3_     | Sorghum haleper                        | 150                                     | 10                                      | No   | FACU                                    |  |
| 4      |  |   |   |  |   |  |
| 5      |  |   |   |  |   | Definitions of Four Vegetation Strata  |
|        |  | *************************************** | *************************************** |  |   | Deminions of Long Aederstroit 2019/8   |
| 6_     |  |   |   |  |   |  |
| 7      |  |   |   |  |   |  |
| 8      |  |   |   |  |   |  |
| 9      |  |   | *************************************** | <del></del>                                  |   |  |
| 10     |  |   |   |  |   | Tree - Woody plants 3 in. (7.6 cm) or more in diameter at  |
|        |  |   | ····                                    | ***************************************      | <del></del>                             | breast height (DBH), regardless of height.   |
| 11_    |  |   |   |  |   | and the service of th |
| 12     |  |   |   |  |   | Sapling/shrub - Woody plants less than 3 in. DBH and   |
| 13     |  |   |   |  |   | greater than 3.28 ft (1 m) tall.   |
|        |  |   |   | P. P. C. | *************************************** | greater than 5.20 it (1 m) tail.   |
| 14     |  |   |   |  |   | Herb - All herbaceous (non woody) plants, regardless of size   |
| 15     |  |   | ·                                       |  |   | Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.   |
|        |  |   | 100 =                                   | Total Cover                                  |   | who woody plants less tright 0.20 It tax.  |
|        |  |   |   |  |   | Woods since Att woods since and the transfer to a contract to  |
|        |  |   | Absolute %                              | Dominant                                     | Indicator                               | Woody vines - All woody vines greater than 3.28 ft in height.  |
| Wood   | dy Vine Stratum                        | Plot Size (30')                         | Cover                                   |  |   |  |
|        |  |   | Cover                                   | Species                                      | Status                                  |  |
| 1_     |  |   |   |  |   |  |
| 2      |  |   |   |  |   |  |
| 3      |  |   |   |  |   |  |
| j ~    |  |   |   |  |   | I  |
| 1 A    |  |   |   |  |   | Hydrophytic  |
| 4_     |  |   |   |  |   |  |
| 4<br>5 |  |   |   |  |   | vegetation   |
| -      |  | *************************************** | 0 =                                     | Total Cover                                  |   |  |
| -      |  | *************************************** | 0 =                                     | Total Cover                                  | *************************************** | vegetation present? No   |
| 5_     | for Hollids                            |   |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |
| 5_     | rks: (Include photo                    | numbers here or on a                    |   | Total Cover                                  |   |  |

VEGETATION (Four Strata) -- Us cientific names of plants

Sampling Point: DP4

| Depth<br>Inches) Cold | Describe to the depth of Matrix or (moist) % YR 4/3 80 | needed to document the<br>Redox<br>Color (moist)<br>10YR 5/4 | Features % Type¹ 20 C           | m the absence of Loc² M | of indicators.) Texture silty clay | Sampling Point: DP4  Remarks                                  |
|-----------------------|--|--|---------------------------------|-------------------------|------------------------------------|---|
| Depth<br>Inches) Cold | Matrix<br>or (moist) %                                 | Redox<br>Color (moist)                                       | Features<br>% Type <sup>1</sup> | Loc <sup>2</sup>        | Texture                            | Remarks   |
|                       |  |  |                                 |                         |                                    |   |
| 0-14 10               | YR 4/3 80  | 10YR 5/4   | 20 C                            | M                       | silty clay                         |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 | ŀ                       |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
| 1                     |  |  |                                 |                         |                                    |   |
| 0-0                   | ina D-Doublina DM-                                     | Dadward Heads Afonts   |                                 | 2                       | 17.5. 88 88.15                     |   |
| ic Soil Indicato      |  | Reduced Matrix, MS=M   | asked Sand Grain                | ·                       |                                    | antia Unidaia Carla   |
| ic son mulcator       | ъ.   |  |                                 | ın                      | dicators for Problem               | nauc nyuric sons:   |
| Histisol (A1          | )  | Dark S   | urface (S7)                     |                         |                                    | 2 cm Muck (A10) (MLRA 147)                                    |
| Histic Epipe          | •  |  | lue Below Surface               | (S9) (MLRA 14           | 7, 148)                            | Coast Prairie Redox (A16)                                     |
| Black Histic          |  |  | ark Surface (S9) (              |                         |                                    | (MLRA 147, 148)   |
| Hydrogen S            | ulfide (A4)  | Loamy  | Gleyed Matrix (F                | 2)                      |                                    | Piedmont Floodplain Soils (F19)                               |
| Stratified La         |  | Deplete  | ed Matrix (F3)                  |                         | *******                            | (MLRA 136, 147)   |
|                       | (A10) <b>(LRR N)</b>                                   |  | Dark Surface (F6                | •                       |                                    | Very Shallow Dark Surface (TF12)                              |
|                       | elow Dark Surface (A1                                  | -  | ed Dark Surface (               |                         | •                                  | Other (Explain in Remarks)                                    |
|                       | Surface (A12)<br>k Mineral (S1) (LRR,N                 |  | Depressions (F8)                |                         |                                    |   |
| MLRA 147,             |  | MLRA   | anganese Masses                 | (F12) (LKK N            |                                    |   |
|                       | Matrix (S4)  |  | :30)<br>: Surface (F13) (N      | MLRA 136, 122)          |                                    |   |
| Sandy Red             |  |  | ont Floodplain Soi              |                         | 148)                               | *Indicators of hydrophytic vegetation                         |
| Stripped Ma           |  |  | arent Material (F2              |                         |                                    | and wetland hydrology must be<br>present, unless disturbed or |
| <del></del>           |  | -  |                                 |                         |                                    | problematic   |
|                       |  |  |                                 |                         |                                    |   |
|                       |  |  |                                 |                         |                                    |   |
| trictive Layer (if    | observed):   |  |                                 |                         |                                    |   |
| <del></del>           |  |  |                                 | Hydric soi              | l present?                         | No  |
| th (inches):          |  |  |                                 |                         |                                    |   |
| arks:                 |  |  |                                 |                         |                                    |   |

# APPENDIX B RAPID BIOASSESSMENT PROTOCOL FORMS

|   |        |            |           | High Gradier            | nt Bioa   | assess    | ment S                       | trea  | m Vis      | it Sh                    | eet          |              |                               |         |  |
|---|--------|------------|-----------|-------------------------|-----------|-----------|------------------------------|-------|------------|--------------------------|--------------|--------------|-------------------------------|---------|--|
| STREAM NAM                                | iE:    | Intermitte | ent Strea | m 1                     |           |           | LOCATI                       | ON:   | Old He     | ady Pr                   | operty       |              |                               |         |  |
| STATION#: F                               | RBP 1  |            |           |                         |           |           | COUNT                        | Y:    | Jefferso   | on                       |              | PRO.         | JECT: 20-236                  | •       |  |
| INVESTIGATE                               | ORS:   | R. Fangn   | nan/ Z. 1 | riplett                 |           |           | DATE:                        | 1/11/ | 2021       | ·                        | TIME:        | 9:41         | AM 🖸                          | РМ 🗌    |  |
| Verify Site LAT/L                         | ONG v  | s GPS      | Yes       | □ No □ N/A              |           |           |                              |       | CAN        | OPY (                    | OVER::       |              | STREAM TYPE:                  |         |  |
|   |        |            |           |                         |           |           |                              | Fully | Expose     | d (0-25                  | 5%)          | Ø            | Perennial                     |         |  |
|   |        | Station    |           | Downstream              |           | Upstream  | n                            | Parti | ally Expo  | osed (2                  | 25-50%)      |              | Ephemeral                     |         |  |
| LAT                                       |        | 38.17250   | 7         |                         |           |           |                              | Parti | ally Sha   | ded (50                  | )-75%)       |              | Intermittent                  | ☑       |  |
| LONG                                      | -      | 85.51808   | 1         |                         |           |           |                              | Fully | Shaded     | i (75-10                 | 00%)         |              |                               |         |  |
| WEATHE                                    | R      | Now        | Past 2    | 4 hours                 |           | LO        | CAL WATERSHED FEATURES (Pred |       | S (Predon  | ominant Surrounding Land |              | <u>Use):</u> |                               |         |  |
| Has there been                            | ı a    |            |           | Heavy rain              |           | Surface   | Mining                       |       | Constru    | ection                   |              |              | Forest                        | Ø       |  |
| scourin <b>g rain ir</b><br>last 14 days? | the    |            |           | Steady rain             |           | Deep Mi   | ning                         |       | Comme      | ercial                   |              |              | Pasture/Grazing               |         |  |
| last 14 days r                            |        |            |           | Intermittent show       | ers.      | Oil Wells | il Wells                     |       | Industrial |                          |              |              | Silviculture                  |         |  |
| Yes 🔲                                     |        |            |           | Clear/sunny             |           | Land Dis  | posal                        |       | Row Cr     | ops                      |              |              | Urban Runoff/<br>Storm Sewers | ✓       |  |
| No 🗹                                      |        | <b>✓</b>   | V         | Cloudy                  | Resident  |           | ial                          | V     |            |                          |              |              | 1                             |         |  |
| INSTRE                                    | AM F   | EATURES    | ,         | HYDRAULIC STRUCTURES ST |           |           | M FLOW                       |       | RIPARI     | AN VE                    | GETATION     | i            | CHANNEL ALTE                  | RATIONS |  |
| Stream Width                              |        | 3-7        | ft        | Dams                    |           | Dry       |                              | Trees | V          | Her                      | baceous      | 7            | Dredging                      |         |  |
| Maximum Dep                               | th     | 0.5        | ft        | Bridge Abutments        |           | Pooled    |                              | Grass | ses 🗹      | Shr                      | ubs          |              | Channelization                |         |  |
| Reach Length                              |        | 50         | m         | Island                  |           | Low       |                              | Dom.  | Tree/St    | rub Ta                   | аха:         |              | (Full) (Pa                    | artial) |  |
| Discha <b>rge</b>                         |        |            | cfs       | Waterfalis              |           | High      |                              |       | wh         | ite oak                  | :            |              | shagbark hic                  | kory    |  |
|   |        |            | _         | Other:                  |           | Normal    | $\square$                    |       | sug        | ar map                   | ie           |              |                               |         |  |
| Riffle/Ru                                 | n/Poo  | l Sequen   | ce        | (No. Sampled in R       | leach)    |           | R                            | iffle | Run        |                          | Pool         |              |                               |         |  |
| P-CHEM                                    |        |            |           | Instrument Used:        |           |           |                              |       |            | ı                        | Date Calibra | ted:         |                               |         |  |
| Temp(°F)                                  |        |            | D.C       | ). (mg/l)               | %Satu     | ration    | •                            | . 1   | oH(\$.U.)  | ******                   | Cond. (µ8    | S/cm)        | Turb                          |         |  |
|   |        |            |           |                         |           |           |                              |       |            |                          |              |              |                               |         |  |
|   |        |            |           |                         | Subst     | rate Cha  | racteriz                     | ation |            |                          |              |              |                               |         |  |
| Substrate E                               | Est.   | P.C        | ).        | Riffle 15               | <u></u> % | Run       | 70                           |       | %          | Pool                     | 15           | %            | Reach To                      | tal     |  |
| Silt/Clay (<0.06                          | 3 mm/0 | 0.002 in)  |           | Х                       |           |           | X                            |       |            | Х                        |              |              |                               |         |  |

|                                  |          | S  | ubstra    | te Chara | cterizati | on |      |    |   |             |
|----------------------------------|----------|----|-----------|----------|-----------|----|------|----|---|-------------|
| Substrate Est. P.C.              | Riffie _ | 15 | <u></u> % | Run      | 70        | %  | Pool | 15 | % | Reach Total |
| Silt/Clay (<0.06 mm/0.002 in)    |          | Х  |           |          | Х         |    |      | Х  |   |             |
| Sand (0,06-2 mm/0,002-0,08 in)   |          | Х  | •         |          | Х         |    |      | Х  |   |             |
| Gravel (2-64 mm/0.08-2.52 in)    |          | Х  |           |          | Х         |    |      | Х  |   |             |
| Cobble (64-256 mm/2.52-10.08 in) |          | Х  |           |          | Х         |    |      | Х  |   |             |
| Boulders (>256 mm/10.08 in)      |          |    |           |          |           |    |      |    | Ī |             |
| Bedrock                          |          | Х  |           |          | Х         |    |      | X  |   |             |

| Bluegrass Bioregio<br>(High Gradient Assessi          |             | Headwater<br>(<5.0 mi²) | Wadeable<br>(>5.0 mi²) |
|---|-------------|-------------------------|------------------------|
| Fully Supporting                                      | (Excellent) | 156-200                 | 130-200                |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                 | 114-129                |
| Not Supporting  | (Poor)      | 0-141                   | 0-113                  |



|   | R  | BP High Gradient Habit   | nt .  |  |
|---|--|--|---|--|
|   | * *  | DE HIGH GIAUICH HADIL  | al  |  |
| Habitat   |  | Condition Categ  |   |  |
| Parameter   | Optimal  | Suboptimal   | Marginal  | Poor   |
| SCORE   | 20 19 18 17 16   | 15 14 13 12 11   | 10 9 8 7 6  | 64321  |
| . Epifaunal   |  |  |   |  |
| Substrate/ Available<br>Cover                       | epifaunal colonization and fish cover; mix of<br>snags, submerged logs, undercut banks,<br>cobble or other stable habitat and at stage   | adequate habitat for maintenance of populations; presence of additional  | 20-40% mix of stable habitat;<br>habitat availability less than<br>desirable; substrate frequently  | Less than 20% stable habitat; lac<br>of habitat is obvious; substrate  |
| 7<br>Score  | to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   | substrate in the form of new fall, but<br>not yet prepared for colonization<br>(may rate at high end of scale).  | disturbed or removed.   | unstable or lacking.   |
| . Embeddedness                                      |  |  |   |  |
| 12<br>Score   | Gravel, cobble, and boulder particles are 0-<br>25% surrounded by fine sediment,<br>Layering of cobble provides diversity of<br>niche space.   | Gravel, cobble, and boulder particles<br>are 25-50% surrounded by fine<br>sediment.  | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.   | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.   |
| 3. Velocity/Depth                                   |  |  |   |  |
| Regime 8<br>Score                                   | All four velocity/depth regimes present<br>(slow-deep, slow-shallow, fast-deep, fast-<br>shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)   | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).   | Only 2 of the 4 habitat regimes<br>present (if fast-shallow or slow-<br>shallow are missing, score low)   | Dominated by 1 velocity/ depth regime (usually slow-deep).   |
| s. Sediment<br>Deposition<br>14<br>Score            | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; mon than 50% (80% for low-gradient) of the bottom changing frequently pools almost absent due to substantial sediment deposition.  |
| 5. Channel  |  |  |   |  |
| Flow Status<br>14<br>Score                          | Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed   | Water fills >75% of the available channel; or <25% of channel substrate is exposed.  | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools  |
| 5. Channel Alteration  17  Score                    | Channelization or dredging absent or minimal; stream with normal pattern.  | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.   | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted<br>Instream habitat greatly altered o<br>removed entirely.                                    |
| 7. Frequency of<br>Riffles (or bends)<br>9<br>Score | Occurrence of riffies relatively frequent, ratio of distance between riffies divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow niffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.  |
| Left/Right Bank                                     | 10 9   | 8 7 6  | 5 4 3   | 2 1  |
| B. Bank Stability  4 LB  7 RB                       | Banks stable; evidence of erosion or bank<br>failure absent or minimal; little potential for<br>future problems. <5% of bank affected.   | Moderately stable; infrequent, small<br>areas of erosion mostly healed over.<br>5-30% of bank in reach has areas of<br>erosion.  | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends;<br>obvious bank sloughing; 60-100%<br>of bank has erosional scars.                                  |
| 9. Vegetative<br>Protection                         | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident;  | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one helf of the noticelist plant. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant   | Less than 50% of the streamban<br>surfaces covered by vegetation;<br>disruption of streambank<br>vegetation is very high; vegetatio<br>has been removed to 5<br>centimeters or less in average |
| <b>3</b> RB   | almost all plants allowed to grow naturally.   | than one-half of the potential plant<br>stubble height remaining.  | stubble height remaining.   | stubble height.  |
| 10. Riparian Vegetative Zone Width  3 LB  RB        | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.  | Width of riparian zone 12-18 meters;<br>human activities have impacted<br>zone only minimally.   | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.   | Width of riparian zone <6 meters<br>little or no riparian vegetation du<br>to human activities   |
|   | ·  | <u> </u>   | <del></del>   | ·  |
| Total Score   | NOTES/COMMENTS:  |  |   |  |

|                   |        |            |           | High Gradier      | it Bio | assessi       | ment S                          | strea   | m Visi    | t Sheet       |                    |                          |          |           |
|-------------------|--------|------------|-----------|-------------------|--------|---------------|---------------------------------|---------|-----------|---------------|--------------------|--------------------------|----------|-----------|
| STREAM NAI        | ΛE:    | Intermitte | ent Strea | m 2               |        |               | LOCATI                          | ON:     | Old Hea   | dy Property   |                    |                          |          |           |
| STATION#:         | RBP 2  |            |           |                   |        |               | COUNT                           | Y:      | Jefferso  | П             | PRO.               | JECT: 20-2               | 36       |           |
| INVESTIGAT        | ORS:   | R. Fangn   | nan/ Z. 1 | riplett           |        |               | DATE:                           | 1/11/2  | 2021      | TIME:         | 11:15              | AM                       | ☑ PM     |           |
| Verify Site LATA  | .ONG v | s GPS      | Yes       | □ No □ N/A        |        |               |                                 |         | CAN       | OPY COVER::   |                    | STREAM TYPE:             |          |           |
| _                 |        |            |           |                   |        |               |                                 | Fully   | Exposed   | (0-25%)       |                    | Perennial                | ****     |           |
|                   |        | Station    |           | Downstream        |        | Upstream      | 1                               | Parti   | aliy Expo | sed (25-50%)  |                    | Ephemeral                |          |           |
| LAT               |        | 38.17289   | 7         |                   |        |               |                                 | Parti   | ally Shad | ed (50-75%)   |                    | Intermittent             |          | Ø         |
| LONG              |        | 85.52272   | 3         |                   |        |               |                                 | Fully   | Shaded    | (75-100%)     | V                  |                          |          |           |
| WEATHE            | R      | Now        | Past 2    | 4 hours           |        | LOC           | AL WAT                          | ERSH    | IED FEA   | TURES (Predor | ninant S           | Surrounding La           | nd Use   | <u>):</u> |
| Has there bee     | n a    |            |           | Heavy rain        |        | Surface N     | /lining                         |         | Constru   | ction         |                    | Forest                   |          | V         |
| scouring rain i   | n the  |            |           | Steady rain       |        | Deep Min      | ing                             |         | Comme     | rcial         |                    | Pasture/Graz             | ing      |           |
| last 14 days?     |        |            |           | Intermittent show | rers   | Oil Wells     |                                 |         | Industria | ıl            |                    | Silviculture             |          |           |
| Yes 🗌             |        |            |           | Clear/sunny       |        | Land Dis      | posal                           |         | Row Cro   | ps            |                    | Urban Rund<br>Storm Sewe |          | Ø         |
| No 🖸              |        | 4          | Ø         | Cloudy            |        | Residential 🔽 |                                 |         |           |               |                    |                          |          |           |
| INSTR             | EAM F  | EATURES    |           | HYDRAULIC STRUC   | TURES  | STREAM        | STREAM FLOW RIPARIAN VEGETATION |         |           | N VEGETATION  | CHANNEL ALTERATION |                          |          | IONS      |
| Stream Width      |        | 6-10       | ft        | Dams              |        | Dry           |                                 | Trees   | · 🗸       | Herbaceous    | V                  | Dredging                 |          |           |
| Maximum Dep       | th     | 0.4        | ft        | Bridge Abutments  |        | Pooled        |                                 | Grass   | ses 🗌     | Shrubs        | V                  | Channelizatio            | n        |           |
| Reach Length      |        | 50         | _<br>_m   | Island            |        | Low           |                                 | Dom.    | Tree/Sh   | rub Taxa:     |                    | (Full)                   | (Partial |           |
| Discha <b>rge</b> |        |            | cfs       | Waterfalls        |        | High          |                                 |         | gree      | en ash        |                    | bush hone                | ysuckle  | ;         |
|                   |        |            |           | Other:            |        | Normal        | Ø                               |         | Eastern   | red cedar     | ***                | hackt                    | епу      |           |
| Riffle/Ru         | n/Poo  | Sequen     | ce        | (No. Sampled in R | each)  |               | R                               | iffle _ | Run       | Pool          |                    |                          |          |           |
| P-CHEM            |        |            |           | Instrument Used:  |        |               |                                 |         |           | Date Calibra  | ted:               |                          |          |           |
| Temp(°F)          |        |            | D.Q       | ). (mg/l)         | %Satu  | ration        |                                 | . ,     | H(S.U.)   | Cond. (µ      | S/cm)              |                          | Turb.    |           |
| <del></del>       |        |            |           |                   |        |               |                                 |         |           |               |                    |                          |          |           |

|                           | Substrate Characterization |        |    |             |     |    |   |      |    |   |             |  |  |
|---------------------------|----------------------------|--------|----|-------------|-----|----|---|------|----|---|-------------|--|--|
| Substrate Est.            | P.C.                       | Riffle | 20 | %           | Run | 50 | % | Pool | 30 | % | Reach Total |  |  |
| Silt/Clay (<0.06 mm/0.002 | in)                        |        | Х  |             |     | Х  |   |      | х  |   |             |  |  |
| Sand (0.06–2 mm/0.002–0   | ).08 in)                   |        | Х  |             |     | Х  |   | 1    | Х  |   |             |  |  |
| Gravel (2-64 mm/0.08-2.   | 52 in)                     |        | X  |             |     | Х  |   |      | Х  |   |             |  |  |
| Cobble (64–256 mm/2.52-   | -10.08 in)                 |        | Х  |             |     | Х  |   |      | Х  |   |             |  |  |
| Boulders (>256 mm/10.08   | in)                        |        | Х  |             |     | Х  |   |      | Х  |   |             |  |  |
| Bedrock                   |                            |        | Х  | <del></del> |     | Х  |   |      | Х  |   |             |  |  |

| Bluegrass Bioregie<br>(High Gradient Assessi          |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeable<br>(>5.0 mi²) |
|---|-------------|--------------------------------------|------------------------|
| Fully Supporting                                      | (Excellent) | 156-200                              | 130-200                |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                              | 114-129                |
| Not Supporting  | (Poor)      | 0-141                                | 0-113                  |

(2011) (Revision 1)



| Project Name:                                       | Old Heady Property   | Stream Na  |   | 2   |
|---|--|--|---|---|
| "   | R  | BP High Gradient Habit   | at  |   |
| Habitat   |  | Condition Cated  | оту   |   |
| Parameter   | Optimal  | Suboptimal   | Marginal  | Poor  |
| SCORE   | 20 19 18 17 16   | 15 14 13 12 11   | 10 9 8 7 8  | 5 4 3 2 1   |
| 1. Epifaunal<br>Substrate/ Available<br>Cover<br>12 | Greater than 70% of substrate favorable for<br>epifaunal colonization and fish cover; mix of<br>snags, submerged logs, undercut banks,<br>cobble or other stable habitat and at stage<br>to allow full colonization potential (i.e.,   |  | 20-40% mix of stable habitat;<br>habitat availability less than<br>desirable; substrate frequently  | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.  |
| Score   | logs/snags that are not new fall and not transient).   | not yet prepared for colonization (may rate at high end of scale).   | disturbed or removed.   | ·   |
| 2. Embeddedness<br>7<br>Score                       | Gravel, cobble, and boulder particles are 0-<br>25% surrounded by fine sediment.<br>Layering of cobble provides diversity of<br>niche space.   | Gravel, cobble, and boulder particles<br>are 25-50% surrounded by fine<br>sediment.  | Gravel, cobble, and boulder<br>particles are 50-75% surrounded<br>by fine sediment.   | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  |
| 3. Velocity/Depth<br>Regime<br>13<br>Score          | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)  | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).   | Only 2 of the 4 habitat regimes<br>present (if fast-shallow or slow-<br>shallow are missing, score low).  | Dominated by 1 velocity/ depth regime (usually slow-deep).  |
| 4. Sediment Deposition  6 Score                     | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected, sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently pools almost absent due to substantial sediment deposition.    |
| 5. Channel<br>Flow Status<br>10<br>Score            | Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed.  | Water fills >75% of the available<br>channel; or <25% of channel<br>substrate is exposed.  | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.  |
| 6. Channel Alteration  18 Score                     | Channelization or dredging absent or minimal; stream with normal pattern.  | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.   | Channelization may be<br>extensive; embankments or<br>shoring structures present on<br>both banks; and 40 to 80% of<br>stream reach channelized and<br>disrupted.   | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted.<br>Instream habitat greatly altered or<br>removed entirely.                                     |
| 7. Frequency of Riffles (or bends)  11              | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.     | Occurrence of riffles infrequent;<br>distance between riffles divided by<br>the width of the stream is between 7<br>to 15.   | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.   |
| Left/Right Bank                                     | 10 9   | 8 7 6  | 6 4 3   | 2 1   |
| 8. Bank Stability  3 LB  3 RB                       | Banks stable; evidence of erosion or bank<br>failure absent or minimal; little potential for<br>future problems. <5% of bank affected.   | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   | Moderately unstable; 30-80% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends;<br>obvious bank sloughing; 60-100%<br>of bank has erosional scars.                                     |
| 9. Vegetative<br>Protection  8 LB  8 RB             | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.                                 | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high, vegetation has been removed to 5 centimeters or less in average stubble height. |
| 10. Riparian<br>Vegetative Zone<br>Width B LB       | Width of riparian zone >18 meters, human<br>activities (i.e. parking lots, roadbeds, clear-<br>cuts, lawns, or crops) have not impacted<br>zone.   | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   | Width of riparian zone 6-12<br>meters; human activities have<br>impacted zone a great deal.   | Width of riparian zone <6 meters:<br>little or no riparian vegetation due<br>to human activities.   |
| Total Score   | NOTES/COMMENTS:  |  |   |   |
|   |  |  |   |   |
| 115   | Poor Quality   |  |   |   |
|   |  |  |   |   |

|                            |       |           |           | High Gradier      | nt Bioa     | assessi   | nent S      | trea                       | m Visit S    | Sheet       |   |                  |           |
|----------------------------|-------|-----------|-----------|-------------------|-------------|-----------|-------------|----------------------------|--------------|-------------|---|------------------|-----------|
| STREAM NAME                | E: 1  | ntermitte | nt Strea  | m 3               |             |           | LOCATI      | ON:                        | Old Heady    | Property    |   |                  |           |
| STATION#: RE               | 3P 3  |           |           |                   |             |           | COUNT       | Υ:                         | Jefferson    |             | PRO.                                    | JECT: 20-236     |           |
| INVESTIGATO                | RS: I | R. Fangn  | nan/ Z. T | riplett           |             |           | DATE:       | 1/11/2                     | 2021         | TIME:       | 11:30                                   | AM 🗹             | PM 🗌      |
| Verify Site LAT/LO         | NG vs | GPS       | Yes       | □ No □ N/A        |             |           |             |                            | CANOP        | Y COVER::   |   | STREAM T         | YPE:      |
|                            |       |           |           |                   |             |           |             | Fully                      | Exposed (0   | -25%)       |   | Perennial        |           |
|                            |       | Station   |           | Downstream        |             | Upstream  | 1           | Parti                      | ally Exposed | (25-50%)    |   | Ephemeral        |           |
| LAT                        | 3     | 8.17201   | 5         |                   |             |           |             | Parti                      | ally Shaded  | (50-75%)    |   | Intermittent     | <b></b> ✓ |
| LONG                       | -8    | 5.52227   | 8         | _                 |             |           |             | Partially Exposed (25-50%) |              |             |   |                  |           |
| WEATHER                    |       | Now       | Past 2    | 4 hours           |             | LOC       | AL WAT      | ERS                        | IED FEATU    | RES (Predo  | minant s                                | Surrounding Land | Use):     |
| Has there been             | я     |           |           | Heavy rain        |             | Surface M | /lining     |                            | Constructio  | n           |   | Forest           | V         |
| scourin <b>g rain in t</b> | -     |           |           | Steady rain       |             | Deep Min  | iing        |                            | Commercia    | d           |   | Pasture/Grazing  |           |
| last 14 days?              |       |           |           | Intermittent show | ers         | Oil Wells |             |                            | Industrial   |             |   | Silviculture     |           |
| Yes 🔲                      |       |           |           | Clear/sunny       |             | Land Dis  | posal       |                            | Row Crops    |             |   |                  | <b>✓</b>  |
| No ☑                       |       | V         | v         | Cloudy            | Residen     |           | ial         | V                          |              |             |   | Owini conc.s     |           |
| INSTREA                    | AM FE | ATURES    |           | HYDRAULIC STRUC   | TURES       | STREAM    | / FLOW      |                            | RIPARIAN     | VEGETATIO   | N                                       | CHANNEL ALTE     | RATIONS   |
| Stream Width               |       | 3-5       | ft        | Dams              |             | Dry       |             | Trees                      | · 🖸 +        | terbaceous  | 7                                       | Dredging         |           |
| Maximum Depth              | , [   | 0.2       | ft        | Bridge Abutments  |             | Pooled    |             | Grass                      | ses 🗌 🖇      | Shrubs      | V                                       | Channelization   |           |
| Reach Length               | _     | 50        | m         | Island            |             | Low       |             | Dom.                       | Tree/Shrub   | Taxa:       |   | (Full) (P        | artial)   |
| Discha <b>rge</b>          | _     |           | cfs       | Waterfalls        |             | High      |             |                            | pin o        | ak          |   | flowering dog    | wood      |
|                            |       |           | ***       | Other:            |             | Normal    | ✓           |                            | bush hone    | ysuckle     | <del></del>                             | Eastern red c    | edar      |
| Riffle/Run                 | /Pool | Sequen    | ce        | (No. Sampled in R | each)       | P         | R           | iffle                      | Run          | Pool        |   |                  |           |
| P-CHEM                     |       |           |           | Instrument Used:  |             |           |             |                            |              | Date Calibr | ated:                                   |                  |           |
| Temp(°F)                   |       |           | D.C       | ). (mg/l)         | %Satur      | ration    |             | _                          | pH(S.U.)     | Cond. (µ    | uS/cm)                                  | Turb             | ).<br>    |
|                            |       |           |           |                   | <del></del> |           | <del></del> | <del></del>                |              |             |   |                  |           |
|                            |       |           |           |                   | Substi      | rate Cha  | racteriz    | ation                      |              |             |   |                  |           |
| Substrate Es               | st.   | P.C       | <b>.</b>  | Riffle 10         | %           | Run       | 80          | !                          | % Poo        | ol 10       | _%                                      | Reach To         | otal      |
| Silt/Clay (<0.06           | mm/0  | .002 in)  |           | х                 |             | 1         | Х           | x x                        |              |             |   |                  |           |
| Sand (0.062 m              | m/0.0 | 02-0.08   | in)       | Х                 | -           | 1         | х           |                            |              | Х           | *************************************** | 1                |           |

| Substrate Characterization       |        |    |   |     |    |   |      |    |   |             |  |  |
|----------------------------------|--------|----|---|-----|----|---|------|----|---|-------------|--|--|
| Substrate Est. P.C.              | Riffle | 10 | % | Run | 80 | % | Pool | 10 | _%                                      | Reach Total |  |  |
| Silt/Clay (<0.06 mm/0.002 in)    |        | Х  |   |     | Х  |   |      | х  |   |             |  |  |
| Sand (0.062 mm/0.0020.08 in)     |        | Х  |   |     | Х  |   |      | Х  |   |             |  |  |
| Gravel (2-64 mm/0.08-2.52 in)    |        | Х  |   |     | Χ  |   |      | Х  |   |             |  |  |
| Cobble (64-256 mm/2.52-10.08 in) |        | Х  |   |     | Х  |   |      | Х  | *************************************** |             |  |  |
| Boulders (>256 mm/10.08 in)      |        |    |   |     |    |   |      |    |   |             |  |  |
| Bedrock                          |        |    |   |     |    |   |      |    |   |             |  |  |

| Bluegrass Bioregi<br>(High Gradient Assess            |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeabie<br>(>5.0 mi²) |
|---|-------------|--------------------------------------|------------------------|
| Fully Supporting                                      | (Excellent) | 156-200                              | 130-200                |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                              | 114-129                |
| Not Supporting  | (Poor)      | 0-141                                | 0-113                  |

| Crawer Control and the control of th | Project Nar                                      |       | Old Heady Property  | Stream Na  |   | ·  |  |
|--|--|-------|---|--|---|--|--|
| Parameter Contract Available Contracting potential (a) 20 (a) 48 (b) 18 (b) 18 (c) 18  |  |       | R   |  |   |  |  |
| ## Control of Section 1997 (1997) of substrate sources for all and programment of section 1997 (1997) of substrate sources for description of the control of |  |       |   |  |   |  |  |
| Security Available  Server  Septiment contrastion or design and contrastion for bender  Server  Septiment contrastion or design place or many contrasting or server  Security Department of substance personnel or security or minored design and server or many contrasting or substance personnel or sub |  | er.   |   |  |   |  |  |
| Crawer Control and the control of th |  |       | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1  |  |
| database or removed minimal da | Cover  |       | epifaunal colonization and fish cover; mix of<br>snags, submerged logs, undercut banks,<br>cobble or other stable habitat and at stage  | suited for full colonization potential;<br>adequate habitat for maintenance of   | habitat availability less than  | Less than 20% stable habitat; lad of habitat is obvious; substrate   |  |
| Graved, cobble, and boulder particles are Codes authorized to the seament Layering of cobbs provides diversity of note space.  In the provides and possible and p | 8<br>Score                                       |       | logs/snags that are not new fall and not  | not yet prepared for colonization  |   | unstable or lacking.   |  |
| Graved, cobble, and boulder particles are Codes authorized to the seament Layering of cobbs provides diversity of note space.  In the provides and possible and p | . Embeddednes                                    | s     |   |  |   |  |  |
| A four velocity/depth regimes present (in disorded points) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 mix) (Slow is e 0.3 mix, deep is > 0.5 |  |       | 25% surrounded by fine sediment.<br>Layering of cobble provides diversity of  | are 25-50% surrounded by fine  | particles are 50-75% surrounded   |  |  |
| 6 eahalow) (Slow is < 0.3 m/s, deep is 100-4 hallow fast cheep, fast- analow) (Slow is < 0.3 m/s, deep is 20-5 mrs)  11  | . Velocity/Depti                                 | h     |   |  |   |  |  |
| Utilitie or no enlargement of islands or point bars and less than 5% (+20% for low-gradient streams) of the bottom affected by sediment deposition.  11  | Regime 6<br>Score                                |       | (slow-deep, slow-shallow, fast-deep, fast-<br>shallow). (Slow is < 0.3 m/s, deep is > 0.5   | fast-shallow is missing, score lower   | present (if fast-shallow or slow-   | Dominated by 1 velocity/ depth regime (usually slow-deep).   |  |
| Water reaches base of both lower banks, and minimal amount of channel substrate is sexposed.  Channel Alteration  18  Some channelization present, usually in areas of bridge abutiments evidence of past channelization present, assually in areas of bridge abutiments evidence of past channelization in the stream past (2) yr.) may be present, but recent channelization present, assually in areas of bridge abutiments or described by the present, but recent channelization in the stream past (2) yr.) may be present, but recent channelization in the stream past (2) yr.) may be present, but recent channelization in stream past (2) yr.) may be present, but recent channelization in the stream past (2) yr.) was the present of statistic stream each channelized and disruging (greater than past (2) yr.) was the present of statistic stream each channelized and disruging (greater than past (2) yr.) was the present of statistic stream each channelization in the present of stream each channelization and darupted.  Occurrence of riffles relatively frequent, distance between riffles divided by width of the stream each channelized and disruging (greater than past (2) yr.) was the present of statistic stream each channelization in the present of stream reach channelized and disruging (greater than past (2) yr.) was the present of statistic stream each of statistic stream each of statistic stream each of stream each of statistic stream each of stream each each of stream each each of stream e | Score  |       | bars and less than 5% (<20% for low-<br>gradient streams) of the bottom affected by   | mostly from gravel, sand or fine<br>sediment; 5-30% (20-50% for low-<br>gradient) of the bottom affected;  | gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected, sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools | Heavy deposits of fine material, increased bar development; mor than 50% (80% for low-gradient) of the bottom changing frequenti pools almost absent due to substantial sediment deposition. |  |
| Channelization or dredging absent or minimal; stream with normal pattern.  The property of the first of behalts of distance between riffles divided by width of the stream value riffles are contunuous, placement of boulders or other large, natural obstruction is important.  The pank stability  A RB  Total Score  Observed the problems, c5% of bank affected  Total Score  Observed the problems, c5% of bank affected  Width of ripanan zone covered by native vegetation, including trees, understorp shubs, or nonwoody macrophytes; vegetative disruption non-hard of the potential for planan zone >18 meters; human activities have impacted zone only minimally  Note than 50% of the streambank surfaces and the planat all plants allowed to grow naturally  Width of ripanan zone >18 meters; human activities have impacted zone only minimally  Note Score  NOTES/COMMENTS:  Note of the stream and invalidation or devident; show the property of the planation of the polarities and the planation of the polarities and the planation of the planation of the polarities and the planation of the planation of the polarities and the planation of the pla | 5. Channel<br>Flow Status<br>7<br>Score          |       | and minimal amount of channel substrate is  | channel; or <25% of channel  | available channel, and/or riffle  | Very little water in channel and mostly present as standing pools  |  |
| Occurrence of rifles relatively frequent, ratiof distance between riffles divided by width of the stream <7.1 (generally 5 to 7) variety of habitat is key in streams where riffles of continuous, placement of boulders or other large, natural obstruction is important.  10 9  8 7 9  8 5 4 3  2 1  Bank Stability  Bank Stability  Bank Stability  Bank Stability  A RB  Wegetative betteen mifles divided by the width of the stream is between 15 to 25.  Moderately stable, infrequent, small areas of erosion mostly healed over failure absent or minimal; little potential for future problems. <5% of bank affected.  More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes, vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.  7 RB  Riparian getative Zone than 8 RB  Total Score  NOTES/COMMENTS:  |  | ation |   | usually in areas of bridge abutments;<br>evidence of past channelization, i.e.,<br>dredging, (greater than past 20 yr.)<br>may be present, but recent  | extensive; embankments or<br>shoring structures present on<br>both banks; and 40 to 80% of<br>stream reach channelized and  | cement; over 80% of the stream<br>reach channelized and disrupted<br>Instream habitat greatly altered of   |  |
| Bank Stability  4 LB  Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  A RB  Wegetative otection  Moderately stable; infrequent, small areas of erosion mostly healed over 5-30% of bank in reach has areas of erosion mostly healed over 5-30% of bank in reach has areas of erosion potential during floods.  More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally  7 RB  Riparian getative Zone dth  8 LB  Width of riparian zone >18 meters; human activities have impacted zone.  NOTES/COMMENTS:  Moderately stable; infrequent, small moderately unstable; 30-60% of bank in reach has areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion potential during floods.  Moderately unstable; 30-60% of bank in reach has areas of erosion potential during floods.  Moderately unstable; 30-60% of bank in reach has areas of erosion potential during floods.  For plants in the streambank surfaces covered by nearly evegetation, but one class of plants is not well-represented, disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.  Width of riparian zone >18 meters; human activities have impacted zone.  Width of riparian zone >18 meters; human activities have impacted zone a great deal  Width of riparian zone <6 meters; human activities have impacted zone a great deal  Width of riparian zone <6 meters; human activities have impacted zone a great deal  Note is a substance of erosion, high erosion potential during floods.  Unstable; rarw areas frequent along straight sections and bends; for of bank has erosional straight sections and bends; for objective to a substance overed by negtation, but on a substance overed by negtatio | r. Frequency of<br>Riffles (or bends<br>5        | ,     | ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction | distance between riffles divided by the width of the stream is between 7   | contours provide some habitat;<br>distance between riffles divided<br>by the width of the stream is   | niffles; poor habitat; distance<br>between riffles divided by the<br>width of the stream is a ratio of   |  |
| Bank Stability  4 LB  Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  A RB  Wegetative otection  Moderately stable; infrequent, small areas of erosion mostly healed over 5-30% of bank in reach has areas of erosion mostly healed over 5-30% of bank in reach has areas of erosion potential during floods.  More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally  7 RB  Riparian getative Zone dth  8 LB  Width of riparian zone >18 meters; human activities have impacted zone.  NOTES/COMMENTS:  Moderately stable; infrequent, small moderately unstable; 30-60% of bank in reach has areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion potential during floods.  Moderately unstable; 30-60% of bank in reach has areas of erosion potential during floods.  Moderately unstable; 30-60% of bank in reach has areas of erosion potential during floods.  For plants in the streambank surfaces covered by nearly evegetation, but one class of plants is not well-represented, disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.  Width of riparian zone >18 meters; human activities have impacted zone.  Width of riparian zone >18 meters; human activities have impacted zone a great deal  Width of riparian zone <6 meters; human activities have impacted zone a great deal  Width of riparian zone <6 meters; human activities have impacted zone a great deal  Note is a substance of erosion, high erosion potential during floods.  Unstable; rarw areas frequent along straight sections and bends; for of bank has erosional straight sections and bends; for objective to a substance overed by negtation, but on a substance overed by negtatio | Left/Right Ba                                    | 77    | 10 9  | 8 7 G  |   | 9 4  |  |
| More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident, almost all plants allowed to grow naturally.  7 RB  Riparian getative Zone dth  8 LB  Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted  8 RB  Total Score  More than 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented, disruption obvious; patches of bare soil or closely cropped vegetation; disruption obvious; patches of bare soil or closely cropped vegetation; disruption obvious; patches of bare soil or closely cropped vegetation is very high; veget than one-half of the potential plant stubble height remaining.  50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation is very high; veget vegetation one-half of the potential plant stubble height remaining.  Width of riparian zone 8 the surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation is very high; veget vegetation one-half of the potential plant stubble height remaining.  Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  Width of riparian zone 46 meters; human activities have impacted zone a great deal.  |  | В     | failure absent or minimal; little potential for   | areas of erosion mostly healed over.<br>5-30% of bank in reach has areas of  | bank in reach has areas of erosion; high erosion potential  | straight sections and bends;<br>obvious bank sloughing; 60-1009  |  |
| Riparian getative Zone dth  Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone.  Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.  Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  Width of riparian zone 6-12 meters; human activities nave impacted zone a great deal.  NOTES/COMMENTS:   |  | B     | and immediate riparian zone covered by<br>native vegetation, including frees,<br>understory shrubs, or nonwoody<br>macrophytes; vegetative disruption through<br>grazing or mowing minimal or not evident;              | covered by native vegetation, but<br>one class of plants is not well-<br>represented, disruption evident but<br>not affecting full plant growth<br>potential to any great extent; more<br>than one-half of the potential plant | surfaces covered by vegetation;<br>disruption obvious, patches of<br>bare soil or closely cropped<br>vegetation common; less than<br>one-half of the potential plant                                  | vegetation is very high; vegetation<br>has been removed to 5<br>centimeters or less in average   |  |
|  | IO. Riparian<br>/egetative Zone<br>Midth<br>8 Li | 8     | activities (i.e., parking lots, roadbeds, clear-<br>cuts, lawns, or crops) have not impacted<br>zone.   | Width of riparian zone 12-18 meters;<br>human activities have impacted   | meters; human activities have   | Width of riparian zone <6 meter.<br>little or no riparian vegetation du<br>to human activities.  |  |
| 400  | iotai Scor                                       | e     | NO : ES/COMMEN IS:  |  |   |  |  |
| THE REPORT DISTRICT  | 100  |       | Poor Quality  |  |   |  |  |
|  |  |       |   |  |   |  |  |

|                     |                                       |            |           | High Gradier                            | nt Bioa | ıssessı   | nent S  | Strea        | m Vis    | it Sheet      |        |                               |        |  |
|---------------------|---------------------------------------|------------|-----------|---|---------|-----------|---|--------------|----------|---------------|--------|-------------------------------|--------|--|
| STREAM NA           | ME:                                   | Intermitte | ent Strea | m 2                                     |         |           | LOCATI  | ON:          | Old He   | ady Property  |        |                               |        |  |
| STATION #:          | RBP 4                                 |            |           |   |         |           | COUNT   | Y:           | Jeffers  | on            | PRO.   | JECT: 20-236                  |        |  |
| INVESTIGA           | TORS:                                 | R. Fangr   | nan/ Z. 1 | riplett                                 |         |           | DATE:   | 1/11/2       | 2021     | TIME:         | 2:15   | AM 🔲 1                        | M 🗹    |  |
| Verify Site LAT     | /LONG                                 | rs GPS     | Yes       | □ No □ N/A                              |         |           |   |              | CAN      | OPY COVER::   |        | STREAM TYPE:                  |        |  |
|                     |                                       |            |           |   |         |           |   | Fully        | Expose   | d (0-25%)     |        | Perennial                     |        |  |
|                     |                                       | Station    |           | Downstream                              |         | Upstream  | 1   | Parti        | ally Exp | osed (25-50%) | V      | Ephemeral                     |        |  |
| LAT                 |                                       | 38.17046   | В         |   |         |           |   | Parti        | ally Sha | ded (50-75%)  |        | Intermittent                  | ☑      |  |
| LONG                |                                       | -85.51935  | 9         |   |         |           |   | Fully        | Shadeo   | l (75-100%)   |        | İ                             |        |  |
| WEATH               | ER                                    | Now        | Past 2    | 4 hours                                 |         | LOC       | CAL WATERSHED FEATURES (Predominant Surrounding Lar |              |          |               |        |                               | se):   |  |
| Has there be        | en a                                  |            |           | Heavy rain                              |         | Surface N | Aining  |              | Constr   | uction        |        | Forest                        | Ø      |  |
| scouring rain       | in the                                |            |           | Steady rain                             |         | Deep Min  | ing   |              | Comm     | ercial        |        | Pasture/Grazing               |        |  |
| last 14 days?       | •                                     |            |           | Intermittent show                       | ers/    | Oil Wells |   |              | Industr  | ial           |        | Silviculture                  |        |  |
| Yes 🔲               |                                       |            |           | Clear/sunny                             |         | Land Dis  | posal   |              | Row C    | rops          |        | Urban Runoff/<br>Storm Sewers | Ø      |  |
| No 🗹                |                                       | 7          | <b>U</b>  | Cloudy                                  |         | Residenti | al  | v            |          |               |        | Otolin Ochers                 |        |  |
| INSTI               | REAM F                                | EATURES    |           | HYDRAULIC STRUC                         | TURES   | STREAM    | FLOW  |              | RIPAR    | AN VEGETATIO  | N      | CHANNEL ALTER                 | ATIONS |  |
| Stream Widt         | h                                     | 3-7        | ft        | Dams                                    |         | Dry       |   | Trees        | · V      | Herbaceous    | 7      | Dredging                      |        |  |
| Maximum De          | epth                                  | 0.5        | <br>ft    | Bridge Abutments                        |         | Pooled    |   | Grass        | ses 🗹    | Shrubs        | v      | Channelization                |        |  |
| Reach <b>Leng</b> t | h                                     | 50         | <b>-</b>  | Island                                  |         | Low       |   | Dom.         | Tree/S   | hrub Taxa:    |        | (Full) (Par                   | ial)   |  |
| Dischar <b>ge</b>   |                                       |            | <br>cfs   | Waterfalls                              |         | High      |   |              | sy       | camore        |        | white oak                     |        |  |
|                     |                                       |            | •••       | Other:                                  |         | Normal    | <b></b> ✓   |              | easter   | n red cedar   |        | sugar maple                   |        |  |
| Riffle/R            | tun/Pod                               | ol Sequen  | ce        | (No. Sampled in R                       | each)   | L         | R   | iffle        | Rur      | nPool         |        |                               |        |  |
| P-CHEM              | · · · · · · · · · · · · · · · · · · · |            |           | Instrument Used:                        |         |           |   |              |          | Date Çalibi   | ated:  |                               |        |  |
| Temp(°F)            |                                       |            | D.0       | ). (mg/l)                               | %Satu   | ration    |   | 1            | pH(S.U.) | Cond. (       | µS/cm) | Turb.                         |        |  |
|                     |                                       |            |           | *************************************** | -       |           |   | <del>-</del> |          |               |        |                               |        |  |
|                     |                                       |            |           |   | Subst   | rate Cha  | racteriz  | ation        |          |               |        |                               |        |  |
| Substrate           |                                       |            |           |   | %       | Run       | 50  | )            | %        | Pool 30       | %      | Reach Tota                    | ıl     |  |

|                  | Substrate Characterization |              |        |    |   |     |    |   |      |    |       |             |  |
|------------------|----------------------------|--------------|--------|----|---|-----|----|---|------|----|-------|-------------|--|
| Substrate £      | ∃st.                       | P.C.         | Riffle | 20 | % | Run | 50 | %                                       | Pool | 30 | %<br> | Reach Total |  |
| Silt/Clay (<0.06 | 6 mm/0.0                   | 02 in)       |        | Х  |   |     | Х  |   |      | Х  |       |             |  |
| Sand (0.06–2     | mm/0.00                    | 20.08 in)    |        | Х  |   |     | Х  |   |      | Х  |       |             |  |
| Gravel (2–64 n   | nm/0.08-                   | 2.52 in)     |        | Х  |   |     | Х  | *************************************** |      | Х  |       |             |  |
| Cobble (64-25    | 6 mm/2.                    | 52-10.08 in) |        | X  |   |     | Х  |   |      | Х  |       |             |  |
| Boulders (>256   | 6 mm/10.                   | 08 in)       |        |    |   |     |    |   |      |    |       |             |  |
| Bedrock          |                            |              |        |    |   |     |    |   |      |    |       |             |  |

| Bluegrass Bioreg<br>(High Gradient Assess          |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeable<br>(>5.0 mi²) | 11 (2) (2)<br>21 (4) (4) |               |     |
|--|-------------|--------------------------------------|------------------------|--------------------------|---------------|-----|
| Fully Supporting                                   | (Excellent) | 156-200                              | 130-200                | ****                     | , <b>t</b> a. |     |
| Supporting but Threatened and Partially Supporting | (Average)   | 142-155                              | 114-129                |                          |               |     |
| Not Supporting                                     | (Poor)      | 0-141                                | 0-113                  | 1                        |               | 100 |

| Habitat Parameter SCORE SCORE SCORE SCORE SCORE SUbstrate/ Available Cover 12 Score Score Secore  | Optimal  20 19 18 17 16  Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.  All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)  Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).  Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).  Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.  Water fills >75% of the available  | 10 9 8 7 6  20-40% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.  Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.  Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).  Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.           | Poor  5 4 3 2 1  Less than 20% stable habitat, lac of habitat is obvious; substrate unstable or lacking.  Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  Dominated by 1 velocity/ depth regime (usually slow-deep).  Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently pools almost absent due to substantial sediment deposition.  Very little water in channel and mostly present as standing pools |
|---|---|--|--|---|
| Parameter SCORE  I. Epifaunal Substrate/ Available Cover  12 Score I. Embeddedness  7 Score I. Velocity/Depth Regime 10 Score I. Sediment Deposition  11 Score I. Channel Flow Status 15 Score I. Score I. Channel I. Score I. Score I. Channel I. Score | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.  All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)  Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                          | Suboptimal  15 14 13 12 11  40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).  Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).  Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.  Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Marginal  10 9 8 7 6  20-40% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.  Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.  Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).  Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Less than 20% stable habitat, lac of habitat is obvious; substrate unstable or lacking.  Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  Dominated by 1 velocity/ depth regime (usually slow-deep).  Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently pools almost absent due to substantial sediment deposition.   |
| SCORE  I. Epifaunal Substrate/ Available Cover  12  Score 2. Embeddedness  7  Score 3. Velocity/Depth Regime 10  Score 4. Sediment Deposition  11  Score 5. Channel Flow Status 15  Score 6. Channel Alteration   | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.  All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)  Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                          | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).  Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).  Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.  Water fills >75% of the available channel, or <25% of channel substrate is exposed.                             | 10 9 8 7 6  20-40% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed  Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.  Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).  Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.            | Less than 20% stable habitat; lad of habitat is obvious; substrate unstable or lacking.  Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  Dominated by 1 velocity/ depth regime (usually slow-deep).  Heavy deposits of fine material, increased bar development; mor than 50% (80% for low-gradient) of the bottom changing frequentipools almost absent due to substantial sediment deposition.  Very little water in channel and  |
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| Score 5. Channel 5. Channel 6. Channel Alteration   | bars and less than 5% (<20% for low-<br>gradient streams) of the bottom affected by<br>sediment deposition.  Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed.  | mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.  Water filts >75% of the available channel, or <25% of channel substrate is exposed.  | gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  | increased bar development; mor<br>than 50% (80% for low-gradient)<br>of the bottom changing frequent<br>pools almost absent due to<br>substantial sediment deposition.  Very little water in channel and  |
| 15 Score 6. Channel Alteration  | and minimal amount of channel substrate is exposed.   | channel, or <25% of channel substrate is exposed.  | available channel, and/or riffle<br>substrates are mostly exposed.   |   |
|   |   | Some channelization present,   |  |   |
| Score   | Channelization or dredging absent or minimal; stream with normal pattern.   | usually in areas of bridge abutments;<br>evidence of past channelization, i.e.,<br>dredging, (greater than past 20 yr.)<br>may be present, but recent<br>channelization is not present.  | Channelization may be<br>extensive; embankments or<br>shoring structures present on<br>both banks; and 40 to 80% of<br>stream reach channelized and<br>disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted<br>Instream habitat greatly altered<br>removed entirely.   |
| 7. Frequency of<br>Riffles (or bends)<br>13   | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.  | Occurrence of riffles infrequent, distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend, bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.  | Generally all flat water or shallor iffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.  |
| Left/Right Bank   | 10 9  | 8 7 6  | 5 4 3  | 2 1   |
| B. Bank Stability  4 LB  4 RB   | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.  | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends;<br>obvious bank sloughing; 60-100<br>of bank has erosional scars.  |
| 9. Vegetative<br>Protection<br>5 LB<br>5 RB   | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident, almost all plants allowed to grow naturally.  | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.   | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common, less than one-half of the potential plant stubble height remaining.  | Less than 50% of the streambar surfaces covered by vegetation disruption of streambank vegetation is very high, vegetation is very high, vegetation is been removed to 5 centimeters or less in average stubble height.   |
| 10. Riparian Vegetative Zone Width  3 LB  RB  | Width of riparian zone >18 meters, human<br>activities (i.e., parking lots, roadbeds, clear-<br>cuts, lawns, or crops) have not impacted<br>zone.   | Width of riparian zone 12-18 meters;<br>human activities have impacted<br>zone only minimally.   | Width of riparian zone 6-12<br>meters; human activities have<br>impacted zone a great deal.  | Width of riparian zone <6 meter<br>little or no riparian vegetation du<br>to human activities.  |
| Total Score   | NOTES/COMMENTS:   |  |  |   |
|   |   |  |  |   |
| 110   | Poor Quality  |  |  |   |

|                         |        |            |           | High Gradier      | nt Bioa | assess        | ment S                 | trea   | m Visit      | Sheet         |          |                        |        |        |
|-------------------------|--------|------------|-----------|-------------------|---------|---------------|------------------------|--------|--------------|---------------|----------|------------------------|--------|--------|
| STREAM NAI              | VE:    | Intermitte | nt Strea  | m 4               |         |               | LOCATI                 | ON:    | Old Head     | ly Property   |          |                        |        |        |
| STATION #:              | RBP 5  |            |           |                   |         |               | COUNT                  | Y:     | Jeffersor    |               | PRO.     | JECT: 20               | -236   |        |
| INVESTIGAT              | ORS:   | R. Fangm   | nan/ Z. 1 | riplett           |         |               | DATE:                  | 1/11/2 | 2021         | TIME:         |          | AN                     |        | РМ □   |
| Verify Site LAT/        | LONG   | rs GPS     | Yes       | □ No □ N/A        |         |               |                        |        | CANC         | PY COVER::    |          | STRE                   | AM TYP | E:     |
|                         |        |            |           |                   |         |               |                        | Fully  | Exposed      | (0-25%)       |          | Perennial              |        |        |
| [                       |        | Station    |           | Downstream        |         | Upstream      | n                      | Partia | ally Expos   | ed (25-50%)   |          | Ephemeral              |        |        |
| LAT                     |        | 38.171913  | 3         |                   |         |               |                        | Partia | ally Shade   | ed (50-75%)   |          | Intermittent           |        | J      |
| LONG                    |        | -85.52072  | 5         |                   |         |               | Fully Shaded (75-100%) |        |              |               |          |                        |        |        |
| WEATHE                  | :R     | Now        | Past 2    | 4 hours           |         | LOC           | CAL WAT                | ERSH   | ED FEAT      | TURES (Predor | ninant : | Surrounding i          | and U  | se):   |
| Has there bee           | n e    |            |           | Heavy rain        |         | Surface I     | Viining                |        | Construc     | tion          |          | Forest                 |        | Ø      |
| scourin <b>g rain</b> i |        |            |           | Steady rain       |         | Deep Mir      | ning                   |        | Commer       | cial          |          | Pasture/Gra            | zing   |        |
| last 14 days?           | days?  |            | Oil Wells |                   |         | Industria     |                        |        | Silviculture |               |          |                        |        |        |
| Yes 🔲                   |        |            |           | Clear/sunny       |         | Land Disposal |                        |        | Row Cro      | ps            |          | Urban Rus<br>Storm Sev |        |        |
| No 🗹                    |        | Ø          | Ø         | Cloudy            |         | Resident      | ial                    | Ø      |              |               |          | Storin Sev             | veis   |        |
| INSTR                   | EAM F  | EATURES    |           | HYDRAULIC STRUC   | TURES   | STREA         | W FLOW                 |        | RIPARIA      | N VEGETATION  |          | CHANNEL.               | ALTER  | ATIONS |
| Stream Width            |        | 2-4        | ft        | Dams              |         | Dry           |                        | Trees  | . ✓          | Herbaceous    | V        | Dredging               |        | П      |
| Maximum Der             | oth    | 0.2        | -<br>ft   | Bridge Abutments  |         | Pooled        |                        | Grass  | ses 🔲        | Shrubs        | ✓        | Channelizat            | ion    |        |
| Reach Length            | i      | 25         | m m       | Island            |         | Low           |                        | Dom.   | Tree/Shr     | ub Taxa:      |          | (Full)                 | (Pan   | tial)  |
| Discharge               |        | ·····      | <br>cfs   | Waterfalls        |         | High          |                        |        | bush ho      | nevsuckle     |          |                        | e oak  |        |
|                         |        | i          | -         | Other:            |         | Normal        | $\overline{Q}$         |        | Eastern      | red cedar     |          |                        |        |        |
| Riffle/Ri               | un/Pod | ol Sequen  | ce        | (No. Sampled in R | each)   | 1             | R                      | iffle  | Run          | Pool          |          |                        |        |        |
| P-CHEM                  |        |            |           | Instrument Used:  |         |               |                        |        |              | Date Calibra  | ted      |                        |        |        |
| Temp(°F)                |        |            | D.0       | D. (mg/l)         | %Satu   | ration        |                        | F      | oH(S.U.)     | Cond. (µ      | S/cm)    |                        | Turb.  |        |
|                         |        |            |           |                   |         |               |                        |        |              |               |          |                        |        |        |

|                                |        | s  | ubstra                                  | te Chara | cterizatio | on |      |    |   |             |
|--------------------------------|--------|----|---|----------|------------|----|------|----|---|-------------|
| Substrate Est. P.C.            | Riffle | 20 | %                                       | Run      | 70         | %  | Pool | 10 | <b>%</b>                                | Reach Total |
| Silt/Clay (<0.06 mm/0.002 in)  |        | х  |   |          | Х          |    |      | Х  |   |             |
| Sand (0.06–2 mm/0.002–0.08 in) |        | Х  | *************************************** |          | Х          |    |      | Х  |   |             |
| Gravel (2-64 mm/0.08-2.52 in)  |        | Х  |   |          | Х          |    |      | Х  | *************************************** |             |
| Cobble (64256 mm/2.5210.08 in) |        | Х  |   |          | Х          |    |      | Х  |   |             |
| Boulders (>256 mm/10.08 in)    |        |    | · i·i                                   |          |            |    |      |    |   |             |
| Bedrock                        |        |    |   |          |            |    |      |    |   |             |

| Bluegrass Bioregi<br>(High Gradient Assess            |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeable<br>(>5.0 mi²) |
|---|-------------|--------------------------------------|------------------------|
| Fully Supporting                                      | (Excellent) | 156-200                              | 130-200                |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                              | 114-129                |
| Not Supporting  | (Poor)      | 0-141                                | 0-113                  |

(2011) (Revision 1)



|  | Old Heady Property   | Stream Na  |   | 4   |
|--|--|--|---|---|
| LI- Line                                       | R  | BP High Gradient Habit   |   |   |
| Habitat  | Optimal  | Condition Cates Suboptimal   |   |   |
| Parameter SCORE                                | 20 19 18 17 16   | 15 14 13 12 11   | Marginal<br>10 9 8 7 6  | Poor  |
| SCORE<br>1. Epifaunal                          | 20 18 10 1/ 18   | 10 14 13 12 11   | 10 9 8 / 6  | 5 4 3 2 1   |
| n. epirauriai<br>Substrate/ Available<br>Cover | Greater than 70% of substrate favorable for<br>epitaunal colonization and fish cover, mix of<br>snags, submerged logs, undercut banks,<br>cobble or other stable habitat and at stage<br>to allow full colonization potential (i.e.,   | 40-70% mix of stable habitat; well-<br>suited for full colonization potential;<br>adequate habitat for maintenance of<br>populations; presence of additional<br>substrate in the form of new fall, but   | 20-40% mix of stable habitat,<br>habitat availability less than<br>desirable; substrate frequently<br>disturbed or removed  | Less than 20% stable habitat; fact of habitat is obvious; substrate unstable or lacking.  |
| Score  | logs/snags that are not new fall and not transient).   | not yet prepared for colonization<br>(may rate at high end of scale).  |   |   |
| 2. Embeddedness                                |  |  |   |   |
| 10<br>Score                                    | Gravel, cobble, and boulder particles are 0-<br>25% surrounded by fine sediment.<br>Layering of cobble provides diversity of<br>niche space.   | Gravel, cobble, and boulder particles<br>are 25-50% surrounded by fine<br>sediment.  | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.   | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  |
| 3. Velocity/Depth                              | 10.5   |  |   |   |
| Regime<br>6<br>Score                           | All four velocity/depth regimes present<br>(slow-deep, slow-shallow, fast-deep, fast-<br>shallow). (Slow is < 0.3 m/s, deep is > 0.5<br>m.)  | Only 3 of the 4 regimes present (if<br>fast-shallow is missing, score lower<br>than if missing other regimes).   | Only 2 of the 4 habitat regimes<br>present (if fast-shallow or slow-<br>shallow are missing, score low).  | Dominated by 1 velocity/ depth regime (usually slow-deep).  |
| 4. Sediment<br>Deposition<br>12<br>Score       | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently pools almost absent due to substantial sediment deposition.    |
| 6. Channel<br>Flow Status<br>10<br>Score       | Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed.  | Water fills >75% of the available<br>channel; or <25% of channel<br>substrate is exposed.  | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.  |
| 6. Channel Alteration  18 Score                | Channelization or dredging absent or minimal; stream with normal pattern.  | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.   | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted.<br>Instream habitat greatly altered or<br>removed entirely.                                     |
| 9  | Occurrence of riffies relatively frequent, ratio of distance between riffies divided by width of the stream <7.1 (generally 5 to 7); variety of habitat is key. In streams where riffies are continuous, placement of boulders or other large, natural obstruction is important.     | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend, bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.   |
| Left/Right Bank                                | 10 9   | 8 7 6  | 5 4 3   | 2 1   |
| 8. Bank Stability  5 LB  5 RB                  | Banks stable, evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.   |  | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |
| <b>8</b> LB                                    | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes, vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.                                 | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
|  | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.  | Width of riparian zone 12-18 meters;<br>human activities have impacted<br>zone only minimally.   | Width of riparian zone 6-12<br>meters; human activities have<br>impacted zone a great deal.   | Width of riparian zone <6 meters:<br>little or no riparian vegetation due<br>to human activities.   |
| Total Score                                    | NOTES/COMMENTS:  |  |   |   |

High Gradient Bioassessment Stream Visit Sheet

| STREAM NA         | ME:           | Intermitte | nt Strea | m 5               |       |           | LOCATI  | ON:    | Old Hea   | dy Propert | :y                                      |        |                    |          |         |   |
|-------------------|---------------|------------|----------|-------------------|-------|-----------|---------|--------|-----------|------------|---|--------|--------------------|----------|---------|---|
| STATION #:        | RBP 6         |            |          |                   |       |           | COUNT   | Y:     | Jefferso  | n          |   | PRO.   | ECT: 2             | 0-236    |         |   |
| INVESTIGAT        | rors:         | R. Fangm   | an/Z.T   | riplett           |       |           | DATE:   | 1/11/2 | 021       | TIME       | :                                       | 3:56   | /                  | M 🗌      | PM      | Image: section of the |
| Verify Site LAT/  | LONG v        | s GPS      | Yes      | □ No □ N/A        |       |           |         |        | CANC      | OPY COV    | ER::                                    |        | ŞTR                | EAM T    | YPE:    |   |
|                   |               |            |          |                   |       |           |         | Fully  | Exposed   | (0-25%)    |   |        | Perennia           |          |         |   |
|                   |               | Station    |          | Downstream        |       | Upstream  | n       | Partia | illy Expo | sed (25-50 | )%)                                     |        | Ephemer            | al       |         |   |
| LAT               | 3             | 38.170885  |          |                   |       |           |         | Partia | ally Shad | ed (50-759 | %)                                      |        | Intermitte         | nt       |         | V   |
| LONG              | -             | 85.524064  | Į.       |                   |       |           |         | Fully  | Shaded    | (75-100%)  | )                                       | Ø      |                    |          |         |   |
| WEATH             | ER            | Now        | Past 2   | 4 hours           |       | LOC       | CAL WAT | ERSH   | ED FEA    | TURES (E   | redomi                                  | nant S | urroundin          | Land     | Use):   |   |
| Has there bee     | en a          |            |          | Heavy rain        |       | Surface I | Mining  |        | Construc  | ction      | *************************************** |        | Forest             |          |         | V   |
| scouring rain     | in the        |            |          | Steady rain       |       | Deep Mir  | ning    |        | Comme     | rcial      |   |        | Pasture/G          | razing   |         | V   |
| last 14 days?     |               |            |          | Intermittent show | ers   | Oil Wells | ;       |        | Industria | il         |   |        | Silvicultur        | е        |         |   |
| Yes 🔲             |               |            |          | Clear/sunny       |       | Land Dis  | posal   |        | Row Cro   | ops        |   |        | Urban R<br>Storm S |          |         |   |
| No 🖸              |               | <b>V</b>   | V        | Cloudy            |       | Resident  | ial     |        |           |            |   |        | O.O.I.I.           | 011010   |         |   |
| INSTR             | REAM FE       | ATURES     |          | HYDRAULIC STRUC   | TURES | STREA     | VI FLOW |        | RIPARIA   | N VEGET    | ATION                                   |        | CHANNE             | L ALTE   | RATI    | ONS   |
| Stream Width      | 1             | 3-6        | ft       | Dams              |       | Dry       |         | Trees  | V         | Herbace    | ous                                     | V      | Dredging           |          |         |   |
| Maximum De        | <b>pt</b> h ' | 0.2        | ft       | Bridge Abutments  |       | Pooled    |         | Grass  | es 🗌      | Shrubs     |   | V      | Channeliz          | ation    |         |   |
| Reach Length      | 1             | 50         | m        | Island            |       | Low       |         | Dom.   | Tree/Shi  | rub Taxa:  |   |        | (Full)             | (P       | artial) |   |
| Dischar <b>ge</b> | •             |            | cfs      | Waterfalls        |       | High      |         |        | eastem    | red cedar  |   |        | gr                 | een as   | 1       |   |
|                   | •             |            | -        | Other:            |       | Normal    | V       |        | black     | walnut     |   |        | sug                | er map   | le      |   |
| Riffle/R          | un/Poo        | l Sequenc  | e        | (No. Sampled in R | each) |           | R       | iffle  | Run       | Poo        | l                                       |        |                    | <u> </u> |         |   |
| P-CHEM            |               |            |          | Instrument Used:  |       |           |         |        |           | Date       | Calibrate                               | ed:    |                    |          |         |   |
| Temp(°F)          |               |            | D.0      | D. (ma/l)         | %Satu | ration    |         | Đ      | H(S.U.)   | Co         | nd. (μS/                                | cm)    |                    | Turb     | 1       |   |

|                                  |        | Ş  | ubstra   | te Chara | cterizati | on |      |    |   |             |
|----------------------------------|--------|----|----------|----------|-----------|----|------|----|---|-------------|
| Substrate Est. P.C.              | Riffle | 10 | <b>%</b> | Run      | 80        | %  | Pool | 10 | % | Reach Total |
| Silt/Clay (<0.06 mm/0.002 in)    |        | Х  |          |          | Х         |    |      | Х  |   |             |
| Sand (0.06–2 mm/0.002–0.08 in)   |        | Х  |          |          | Х         |    |      | Х  |   |             |
| Gravel (2-64 mm/0.08-2.52 in)    |        | X  |          |          | Х         |    |      | Х  |   |             |
| Cobble (64-256 mm/2.52-10.08 in) |        | Х  |          |          | Х         |    |      | Х  |   |             |
| Boulders (>256 mm/10.08 in)      |        |    |          |          |           |    |      |    |   |             |
| Bedrock                          |        | Х  |          |          | Χ         |    |      | Х  |   |             |

| Bluegrass Biore<br>(High Gradient Asses               |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeable<br>(>5.0 mi²) | ************************************** | 1  |        |
|---|-------------|--------------------------------------|------------------------|--|----|--------|
| Fully Supporting                                      | (Excellent) | 156-200                              | 130-200                |  |    | , b    |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                              | 114-129                |  |    |        |
| Not Supporting  | (Poor)      | 0-141                                | 0-113                  | 1 200                                  | 77 | 44. F. |

| Project Name:                                    | Old Heady Property   | Stream Na  |   | Ü  |
|--|--|--|---|--|
| 1500000  | R  | BP High Gradient Habit   |   |  |
| Habitat<br>Parameter                             | Optimal  | Condition Cates Suboptimal   | ory<br>Marginal   | Poor   |
| SCORE  | 20 19 18 17 16   | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1  |
| 1. Epifaunai                                     | 20 19 10 17 16   | 18 14 13 12 11   | 10 3 6 7 6  | 3 4 3 2 1  |
| Substrate/ Available<br>Cover                    | Greater than 70% of substrate favorable for<br>epifaunal colonization and fish cover; mix of<br>snags, submerged logs, undercut banks,<br>cobble or other stable habitat and at stage<br>to allow full colonization potential (i.e.,<br>logs/snags that are not new fall and not     | 1  | 20-40% mix of stable habitat;<br>habitat availability less than<br>desirable; substrate frequently<br>disturbed or removed.   | Less than 20% stable habitat; lack<br>of habitat is obvious; substrate<br>unstable or lacking.   |
| _  | transient).  | (may rate at high end of scale).   | •   |  |
| Score  |  |  |   |  |
| 2. Embeddedness<br>8<br>Score                    | Gravel, cobble, and boulder particles are 0-<br>25% surrounded by fine sediment.<br>Layering of cobble provides diversity of<br>niche space.   | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  | Gravel, cobble, and boulder<br>particles are 50-75% surrounded<br>by fine sediment.   | Gravel, cobble, and boulder<br>particles are more than 75%<br>surrounded by fine sediment.   |
| 3. Velocity/Depth<br>Regime<br>6                 | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5  | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).   | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)  | Dominated by 1 velocity/ depth regime (usually slow-deep).   |
| Score  | m.)  |  | ,   |  |
| 4. Sediment Deposition  8                        | Little or no enlargement of islands or point<br>bars and less than 5% (<20% for low-<br>gradient streams) of the bottom affected by<br>sediment deposition.  | Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.  |
| 5. Channel                                       |  |  |   |  |
| Flow Status<br>8<br>Score                        | Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed.  | Water fills >75% of the available channel; or <25% of channel substrate is exposed.  | Water fills 25-75% of the<br>available channel, and/or riffle<br>substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |
| 6. Channel Alteration  17  Score                 | Channelization or dredging absent or minimal; stream with normal pattern.  | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.   | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted.<br>Instream habitat greatly altered or<br>removed entirely.                                    |
| 7. Frequency of<br>Riffles (or bends)<br>8       | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.     | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.  |
| Left/Right Bank                                  | 10 9   | 8 7 6  | 5 4 3   | 2 1  |
| 8. Bank Stability 4 LB 4 RB                      | Banks stable; evidence of erosion or bank<br>failure absent or minimal; little potential for<br>future problems. <5% of bank affected  | Moderately stable, infrequent, small   | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends,<br>obvious bank sloughing; 60-100%<br>of bank has erosional scars.                                    |
| 9. Vegetative Protection  8 LB  8 RB             | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident, almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation, disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.                                 | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetatior has been removed to 5 centimeters or less in average stubble height |
| 10. Riparian<br>Vegetative Zone<br>Width<br>6 LB | Width of ripanan zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   | Width of riparian zone 12-18 meters;<br>human activities have impacted<br>zone only minimally.   | Width of riparian zone 6-12<br>meters; human activities have<br>impacted zone a great deal.   | Width of riparian zone <6 meters:<br>little or no riparian vegetation due<br>to human activities.  |
| Total Score                                      | NOTES/COMMENTS:  |  |   |  |
|  |  |  |   |  |
| 98   | Poor Quality   |  |   |  |
|  |  |  |   |  |

|                  |        |            |           | High Gradier                            | rt Bioa | essessi   | ment S | trea       | m Visi    | t Sheet       |          |                          |   |          |
|------------------|--------|------------|-----------|---|---------|-----------|--------|------------|-----------|---------------|----------|--------------------------|---|----------|
| STREAM NA        | ME:    | Intermitte | nt Strea  | m 6                                     |         |           | LOCATI | ON:        | Old Hea   | dy Property   |          |                          |   |          |
| STATION #:       | RBP 7  |            |           |   |         |           | COUNT  | Y:         | Jefferso  | n             | PRO.     | JECT: 20-2               | 36                                      |          |
| INVESTIGAT       | rors:  | R. Fangm   | ian/ Z. T | riplett                                 |         |           | DATE:  | 1/11/      | 2021      | TIME:         | 4:20     | АМ                       | ] PM [                                  | 7        |
| Verify Site LAT/ | LONG v | rs GPS     | Yes       | □ No □ N/A                              |         |           |        |            | CAN       | OPY COVER::   |          | STREAM                   | A TYPE:                                 |          |
|                  |        |            |           |   |         |           |        | Fully      | Exposed   | l (0-25%)     |          | Perennial                |   | J        |
|                  |        | Station    |           | Downstream                              |         | Upstrean  | n      | Parti      | ally Expo | sed (25-50%)  |          | Ephemeral                |   | וכ       |
| LAT              |        | 38.169314  |           |   |         |           |        | Parti      | ally Shad | ed (50-75%)   | V        | Intermittent             | [                                       | 3        |
| LONG             |        | -85.522824 | \$        |   |         |           |        | Fully      | Shaded    | (75-100%)     |          |                          |   |          |
| WEATH            |        | Now        | Past 2    | 4 hours                                 |         | LOC       | AL WAT | ERSI       | IED FEA   | TURES (Predon | ninant : | Surrounding La           | nd Use):                                |          |
| Has there bee    | n a    |            |           | Heavy rain                              |         | Surface N | Vining |            | Constru   | ction         |          | Forest                   |   | 7        |
| scouring rain    |        |            |           | Steady rain                             |         | Deep Mir  | ning   |            | Comme     | rcial         |          | Pasture/Grazi            | ng [                                    | <u> </u> |
| last 14 days?    |        |            |           | Intermittent show                       | ers     | Oil Wells |        |            | industria | af            |          | Silviculture             |   |          |
| Yes 🔲            |        |            |           | Clear/sunny                             |         | Land Dis  | posal  |            | Row Cro   | pps           |          | Urban Runo<br>Storm Sewe |   |          |
| No 🗹             |        | Ø          | Ø         | Cloudy                                  |         | Residenti | ial    | V          |           |               |          | Storin Sewe              | 15                                      |          |
| INSTR            | EAM F  | EATURES    |           | HYDRAULIC STRUC                         | TURES   | STREAM    | A FLOW |            | RIPARIA   | N VEGETATION  | ı        | CHANNEL AL               | TERATIO                                 | N\$      |
| Stream Width     |        | 2-5        | ft        | Dams                                    |         | Dry       |        | Trees      | · 🗹       | Herbaceous    | ¥        | Dredging                 |   | ]        |
| Maximum De       | pth    | 0.2        | ft        | Bridge Abutments                        |         | Pooled    |        | Grass      | ses 🔽     | Shrubs        | V        | Channelization           | n [                                     | <u>ו</u> |
| Reach Length     | 1      | 25         | m         | Island                                  |         | Low       |        | Dom.       | Tree/Sh   | rub Taxa:     |          | (Full) 🔲                 | (Partial)                               | ן        |
| Discharge        |        |            | <br>cfs   | Waterfalls                              |         | High      |        |            | eastern   | red cedar     |          | hackb                    | епу                                     | $\neg$   |
|                  |        |            | *         | Other:                                  |         | Normal    | ✓      |            | syc       | amore         |          | sugar n                  | napie                                   |          |
| Riffle/R         | un/Poc | Sequenc    | e         | (No. Sampled in R                       | each)   |           | R      | ffle_      | Run       | Pool          |          |                          |   |          |
| P-CHEM           |        |            |           | Instrument Used:                        |         |           |        | ********** |           | Date Calibra  | ted:     |                          |   |          |
| Temp(°F)         |        |            | Đ.C       | ). (mg/l)                               | %Satu   | ration    |        | i          | pH(S.U.)  | Cond. (μ      | S/cm)    | r                        | Turb.                                   |          |
|                  |        |            | -         | *************************************** |         |           |        |            |           | <del></del>   |          |                          | *************************************** |          |

|                                  |           | Substra | ite Chara | cterizati | on |      |    |   |             |
|----------------------------------|-----------|---------|-----------|-----------|----|------|----|---|-------------|
| Substrate Est. P.C.              | Riffle 10 | %       | Run       | 80        | %  | Pool | 10 | % | Reach Total |
| Silt/Clay (<0.06 mm/0.002 in)    | Х         |         |           | Х         |    |      | Х  |   |             |
| Sand (0.06–2 mm/0.002–0.08 in)   | ×         |         |           | Х         |    |      | х  |   |             |
| Gravel (2-64 mm/0.08-2.52 in)    | ×         |         |           | Х         |    |      | Х  |   |             |
| Cabble (64-256 mm/2.52-10.08 in) | х         |         |           | Х         |    |      | Х  |   |             |
| Boulders (>256 mm/10.08 in)      |           |         |           |           |    |      |    |   |             |
| Bedrock                          |           |         |           |           |    |      |    |   |             |

| Bluegrass Bioreg<br>(High Gradient Assess             |             | Headwater<br>(<5.0 mi <sup>2</sup> ) | Wadeable<br>(>5.0 mi²) |                |
|---|-------------|--------------------------------------|------------------------|----------------|
| Fully Supporting                                      | (Excellent) | 156-200                              | 130-200                | All the second |
| Supporting but Threatened and<br>Partially Supporting | (Average)   | 142-155                              | 114-129                |                |
| Not Supporting  | (Poor)      | 0-141                                | 0-113                  |                |

| Project Nar  | ne:    | Old Heady Property   | Stream Na  |   | 0   |
|--|--------|--|--|---|---|
| Habitat  |        | R  | BP High Gradient Habit   |   |   |
| Paramete   |        | Optimal  | Condition Categ<br>Suboptimal  | ory<br>Marginal   | Poor  |
| SCORE  |        | 20 19 18 17 16   | 15 14 15 12 11   | 10 9 8 7 6  | 6 4 3 2 1   |
| 1. Epifaunal<br>Substrate/ Availa                  | able   | Greater than 70% of substrate favorable for  | 40-70% mix of stable habitat; well-  | ***   |   |
| Cover<br>5   |        |  | suited for full colonization potential;<br>adequate habitat for maintenance of<br>populations; presence of additional<br>substrate in the form of new fall, but  | 20-40% mix of stable habitat;<br>habitat availability less than<br>desirable; substrate frequently  | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.  |
| Score  |        | logs/snags that are not new fall and not transient).   | not yet prepared for colonization<br>(may rate at high end of scale).  | disturbed or removed.   | unstable of launing.  |
| 2. Embeddednes                                     | ss     |  |  |   |   |
| 7<br>Score   |        | Gravel, cobble, and boulder particles are 0-<br>25% surrounded by fine sediment.<br>Layering of cobble provides diversity of<br>niche space.   | Gravel, cobble, and boulder particles<br>are 25-50% surrounded by fine<br>sediment.  | Gravel, cobble, and boulder<br>particles are 50-75% surrounded<br>by fine sediment.   | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  |
| 3. Velocity/Depti                                  | h      |  |  |   |   |
| Regime 5 Score                                     |        | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)  | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).   | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).   | Dominated by 1 velocity/ depth regime (usually slow-deep).  |
| 4. Sediment Deposition  8                          |        | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.  | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected, slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| 5. Channel   |        |  |  |   |   |
| Flow Status  6 Score                               |        | Water reaches base of both lower banks,<br>and minimal amount of channel substrate is<br>exposed.  | Water fills >75% of the available channel, or <25% of channel substrate is exposed.  | Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.  | Very little water in channel and mostly present as standing pools.  |
| 6. Channel Altera 10 Score                         |        | Channelization or dredging absent or minimal; stream with normal pattern.  | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.               | Channelization may be extensive, embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted.<br>Instream habitat greatly altered or<br>removed entirely.                                   |
| 7. Frequency of<br>Riffles (or bends<br>5<br>Score | \$)    | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.   |
| Left/Right Ba                                      | ınk    | 10 9   | 8 7 6  | 5 4 3   | 2 1   |
|  |        | Banks stable; evidence of erosion or bank<br>failure absent or minimal; little potential for<br>future problems. <5% of bank affected.   | areas of erosion mostly healed over.   | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends;<br>obvious bank sloughing; 60-100%<br>of bank has erosional scars.                                   |
| 9. Vegetative<br>Protection                        | (B     | More than 90% of the streambank surfaces   | 70-90% of the streambank surfaces covered by native vegetation, but  | 50-70% of the streambank  | Less than 50% of the streambank   |
|  | .B<br> | and immediate riparian zone covered by<br>native vegetation, including trees,<br>understory shrubs, or nonwoody<br>macrophytes; vegetative disruption through<br>grazing or mowing minimal or not evident;<br>almost all plants allowed to grow naturally.                       | one class of plants is not well-<br>represented, disruption evident but<br>not affecting full plant growth<br>potential to any great extent; more<br>than one-half of the potential plant<br>stubble height remaining. | surfaces covered by vegetation;<br>disruption obvious; patches of<br>bare soil or closely cropped<br>vegetation common; less than<br>one-half of the potential plant<br>stubble height remaining.   | surfaces covered by vegetation;<br>disruption of streambank<br>vegetation is very high; vegetation<br>has been removed to 5<br>centimeters or less in average<br>stubble height.                |
|  | В      | Width of riparian zone >18 meters; human<br>activities (i.e., parking lots, roadbeds, clear-<br>cuts, lawns, or crops) have not impacted<br>zone.  | Width of riparian zone 12-18 meters;<br>human activities have impacted<br>zone only minimally.   | Width of riparian zone 6-12<br>meters; human activities have<br>impacted zone a great deal.   | Width of riparian zone <6 meters;<br>little or no riparian vegetation due<br>to human activities.   |
| Total Scor   | re     | NOTES/COMMENTS:  |  |   | <u> </u>  |
| 00   |        |  |  |   |   |

### APPENDIX C

APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)

#### I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): 1/29/2021

ORM Number: Associated JDs: N/A

Review Area Location¹: State/Territory: Kentucky City: Louisville County/Parish/Borough: Jefferson

Center Coordinates of Review Area: Latitude 38.171698° Longitude -85.521692°

#### II. FINDINGS

| A. | Summary: Check all that apply. At least one box from the following list MUST be selected. | Complete the |
|----|---|--------------|
|    | corresponding sections/tables and summarize data sources.                                 |              |

- The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- ☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).
- There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in Section II.C).
- There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

#### B. Rivers and Harbors Act of 1899 Section 10 (§ 10)<sup>2</sup>

| § 10 Name | § 10 Size |     | § 10 Criteria | Rationale for § 10 Determination |
|-----------|-----------|-----|---------------|----------------------------------|
| N/A.      | N/A.      | N/A | N/A.          | N/A.                             |

#### C. Clean Water Act Section 404

| Territorial Seas and Traditional Navigable Waters ((a)(1) waters):3 |             |      |                 |                                    |  |  |  |
|---|-------------|------|-----------------|------------------------------------|--|--|--|
| (a)(1) Name   | (a)(1) Size |      | (a)(1) Criteria | Rationale for (a)(1) Determination |  |  |  |
| N/A.  | N/A.        | N/A, | N/A.            | N/A.                               |  |  |  |

| Tributaries ((a) | Tributaries ((a)(2) waters): |                |   |  |  |  |  |
|------------------|------------------------------|----------------|---|--|--|--|--|
| (a)(2) Name      | (a)(2) Siz                   | e              | (a)(2) Criteria   | Rationale for (a)(2) Determination   |  |  |  |
| Intermittent 1   | 175                          | linear<br>feet | (a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year. | Intermittent Stream 1 is three to seven feet wide with silt, sand, gravel, cobble and bedrock substrate. During the January 11, 2021 site visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water. |  |  |  |
| Intermittent 2   | 1,789                        | linear<br>feet | (a)(2) Intermittent tributary contributes   | Intermittent Stream 2 is approximately seven feet wide with silt, sand, gravel, cobble, boulders and bedrock substrate. During the January 11, 2021 site   |  |  |  |

<sup>&</sup>lt;sup>1</sup> Map(s)/figure(s) are attached to the AJD provided to the requestor.

<sup>&</sup>lt;sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>&</sup>lt;sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.

| Tributaries ((a)(2) waters): |            |                |   |  |  |  |
|------------------------------|------------|----------------|---|--|--|--|
| (a)(2) Name                  | (a)(2) Siz | ze             | (a)(2) Criteria   | Rationale for (a)(2) Determination   |  |  |
|                              |            |                | surface water<br>flow directly or<br>indirectly to an<br>(a)(1) water in a<br>typical year.                               | visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water.   |  |  |
| Intermittent 3               | 102        | linear<br>feet | (a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year. | Intermittent Stream 3 is three to five feet wide with silt, sand, gravel and cobble substrate. During the January 11, 2021 site visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water.         |  |  |
| Intermittent 4               | 458        | linear<br>feet | (a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year. | Intermittent Stream 4 is two to four feet wide with silt, sand, gravel and cobble substrate. During the January 11, 2021 site visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water.           |  |  |
| Intermittent 5               | 365        | linear<br>feet | (a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year. | Intermittent Stream 5 is three to six feet wide with silt, sand, gravel, cobble and bedrock substrate. During the January 11, 2021 site visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water. |  |  |
| Intermittent 6               | 249        | linear<br>feet | (a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year. | Intermittent Stream 6 is two to five feet wide with silt, sand, gravel and cobble substrate. During the January 11, 2021 site visit the channel contained flowing and pooled water which indirectly contribute to an (a)(1) water.           |  |  |

| Lakes and por | Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters): |         |   |   |  |  |  |
|---------------|---|---------|---|---|--|--|--|
| (a)(3) Name   | (a)(3) Size   |         | (a)(3) Criteria   | Rationale for (a)(3) Determination  |  |  |  |
| Pond 1        | 0.716   | acre(s) | (a)(3) Lake/pond<br>or impoundment<br>of a jurisdictional<br>water contributes<br>surface water<br>flow directly or<br>indirectly to an | Pond 1 has a presumed maximum depth of eight feet with a silt substrate. Pond 1 is connected to downstream (a)(1) waters via Intermittent Stream 6. |  |  |  |

| Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters): |           |      |                                 |                                    |  |  |  |  |
|---|-----------|------|---------------------------------|------------------------------------|--|--|--|--|
| (a)(3) Name   | (a)(3) Si | ze   | (a)(3) Criteria                 | Rationale for (a)(3) Determination |  |  |  |  |
|   |           |      | (a)(1) water in a typical year. |                                    |  |  |  |  |
| N/A.  | N/A.      | N/A. | N/A.                            | N/A.                               |  |  |  |  |

|             | Adjacent wetlands ((a)(4) waters): |      |                 |                                    |  |  |  |  |  |
|-------------|------------------------------------|------|-----------------|------------------------------------|--|--|--|--|--|
| (a)(4) Name | (a)(4) Siz                         | e    | (a)(4) Criteria | Rationale for (a)(4) Determination |  |  |  |  |  |
| N/A.        | N/A.                               | N/A. | N/A.            | N/A.                               |  |  |  |  |  |

#### D. Excluded Waters or Features

| Excluded waters | ((b)(1) - (b) | (12)):4        |   |   |
|-----------------|---------------|----------------|---|---|
| Exclusion Name  | Exclusion     | Size           | Exclusion <sup>5</sup>  | Rationale for Exclusion Determination   |
| Ephemeral 1     | 84            | linear<br>feet | (b)(3) Ephemeral<br>feature, including<br>an ephemeral<br>stream, swale,<br>gully, rill, or pool. | Eph 1 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 1 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 2     | 289           | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 2 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 2 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 3     | 21            | linear<br>feet | (b)(3) Ephemeral<br>feature, including<br>an ephemeral<br>stream, swale,<br>gully, rill, or pool. | Eph 3 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 3 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 4     | 412           | linear<br>feet | (b)(3) Ephemeral<br>feature, including<br>an ephemeral<br>stream, swale,<br>gully, rill, or pool. | Eph 4 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 4 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 5     | 175           | linear<br>feet | (b)(3) Ephemeral<br>feature, including<br>an ephemeral<br>stream, swale,<br>gully, rill, or pool. | Eph 5 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 5 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 6     | 94            | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral  | Eph 6 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field  |

<sup>&</sup>lt;sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1)

<sup>&</sup>lt;sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

| Excluded waters (                     |           |         | Trustusio5            | Dationals for Evaluation Date (1)               |
|---------------------------------------|-----------|---------|-----------------------|---|
| Exclusion Name                        | Exclusion | on Size | Exclusion⁵            | Rationale for Exclusion Determination           |
|                                       |           |         | stream, swale,        | assessment. Eph 6 is a (b)(3) water and is      |
| <b>₽</b>                              | -         |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 7                           | 26        | linear  | (b)(3) Ephemeral      | Eph 7 only contains surface water flowing or    |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 7 is a (b)(3) water and is      |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 8                           | 38        | linear  | (b)(3) Ephemeral      | Eph 8 only contains surface water flowing or    |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 8 is a (b)(3) water and is      |
|                                       |           | *****   | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 9                           | 111       | linear  | (b)(3) Ephemeral      | Eph 9 only contains surface water flowing or    |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 9is a (b)(3) water and is       |
| ·                                     |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 10                          | 120       | linear  | (b)(3) Ephemeral      | Eph 10 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 19 is a (b)(3) water and is     |
| · · · · · · · · · · · · · · · · · · · |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 11                          | 169       | linear  | (b)(3) Ephemeral      | Eph 11 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 11 is a (b)(3) water and is     |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 12                          | 97        | linear  | (b)(3) Ephemeral      | Eph 12 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 12 is a (b)(3) water and is     |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 13                          | 76        | linear  | (b)(3) Ephemeral      | Eph 13 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 13is a (b)(3) water and is      |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 14                          | 139       | linear  | (b)(3) Ephemeral      | Eph 14 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       |           |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 14 is a (b)(3) water and is     |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |
| Ephemeral 15                          | 81        | linear  | (b)(3) Ephemeral      | Eph 15 only contains surface water flowing or   |
|                                       |           | feet    | feature, including    | pooling in direct response to precipitation and |
|                                       | 1         |         | an ephemeral          | had no flow in the channel during the field     |
|                                       |           |         | stream, swale,        | assessment. Eph 15 is a (b)(3) water and is     |
|                                       |           |         | gully, rill, or pool. | therefore excluded from the rule.               |

| Excluded waters | ((b)(1) - (b) | )(12)):4       |   |   |
|-----------------|---------------|----------------|---|---|
| Exclusion Name  | Exclusion     | n Size         | Exclusion <sup>5</sup>  | Rationale for Exclusion Determination   |
| Ephemeral 16    | 167           | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 16 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 16 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 17    | 120           | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 17 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 17 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 18    | 65            | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 18 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 18 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 19    | 45            | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 19 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 19 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 20    | 95            | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 20 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 20 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 21    | 21            | linear<br>feet | (b)(3) Ephemeral<br>feature, including<br>an ephemeral<br>stream, swale,<br>gully, rill, or pool. | Eph 21 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 21 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 22    | 31            | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 22 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 22 is a (b)(3) water and is therefore excluded from the rule. |
| Ephemeral 23    | 135           | linear<br>feet | (b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.             | Eph 23 only contains surface water flowing or pooling in direct response to precipitation and had no flow in the channel during the field assessment. Eph 23 is a (b)(3) water and is therefore excluded from the rule. |

#### **III. SUPPORTING INFORMATION**

A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

oximes Information submitted by, or on behalf of, the applicant/consultant: Request for Jurisdictional Determination for Sunrise Builders, LLC

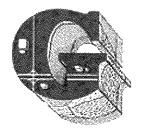
This information is sufficient for purposes of this AJD.

|             | Rationale: N/A  |
|-------------|---|
|             | Data sheets prepared by the Corps: Title(s) and/or date(s).                       |
| $\boxtimes$ | Photographs: Aerial and Other: site photographs January 11, 2021                  |
|             | Corps site visit(s) conducted on: Date(s).  |
|             | Previous Jurisdictional Determinations (AJDs or PJDs): ORM Number(s) and date(s). |
|             | Antecedent Precipitation Tool: provide detailed discussion in Section III.B.      |
| $\boxtimes$ | USDA NRCS Soil Survey: SSURGO, Jefferson County, Kentucky (2008).                 |
|             | USFWS NWI maps: Title(s) and/or date(s).  |
| $\times$    | USGS topographic maps: 1:24,000 – Jeffersontown, Kentucky Quadrangle.             |

#### Other data sources used to aid in this determination:

| Data Source (select)       | Name and/or date and other relevant information |
|----------------------------|---|
| USGS Sources               | N/A.  |
| USDA Sources               | N/A.  |
| NOAA Sources               | N/A.  |
| USACE Sources              | NA.   |
| State/Local/Tribal Sources | NA.   |
| Other Sources              | N/A.  |

- **B.** Typical year assessment(s): N/A or provide typical year assessment for each relevant data source used to support the conclusions in the AJD.
- C. Additional comments to support AJD: N/A or provide additional discussion as appropriate.



## GREENBAUM ASSOCIATES, INC. GEOTECHNICAL & MATERIALS ENGINEERS

994 Longfield Avenue Louisville, Kentucky 40215 502/361-8447 FAX 502/361-4793

April 25, 2021

Mr. David Garrett Sunshine Builders, LLC 2703 Sparrows Point Place Louisville, KY 40245

Re: Slope Survey

**Garrett Bridwell Subdivision** 

Old Heady Road Louisville, Kentucky Project Number 21-089E

Dear Mr. Garrett:

On April 22, 2021, Mr. Luke Van Nevel, EIT, walked the above referenced property and viewed several slopes with a greater than 20-degree inclination. Included is a drawing showing the approximate locations of the slopes (indicated by yellow shading) as well as a drawing showing the geologic mapping taken from the Kentucky Geological Survey. Most of the slopes located along the small tributary running northwest to southeast, just northeast of Saddle Bend Way. Also included are photos of several of the slopes taken during a walkover of the site. During the walkover, no evidence was found of slope movement, i.e.., no visual indication of landslide such as bulges or tension cracks indicative of a scarp.

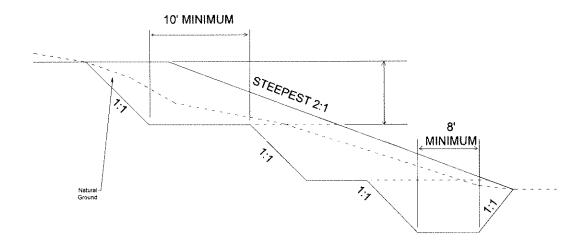
This site is shown by the Kentucky Geological Survey to be underlain by the Drake's Formation. The Geological Survey describes the Drakes Formation as:

Grayish green dolomite or limy silty mudstone and lesser amounts of argillaceous, fine-grained dolomite or dolomitic limestone. Megafossils absent or sparse in mudstone, some dolomite beds contain abundant poorly preserved bryozoans or brachiopods. Mudstone contains ripplemarks and mudcracks. 135 ft thick at type section. Divided into Rowland and overlying Preachersville Members. Conformably overlies Ashlock Formation; disconformably overlain by Brassfield Dolomite. Assigned to Late Ordovician. Approximately same rocks called the Waynesville limestone and overlying Liberty and Whitewater formations.

The topography of this property is rolling, resulting in substantial cuts and fills. When fill is to be placed on an existing slope it is imperative that the existing slope be benched as shown in the diagram below to prevent the formation of a plane of weakness along which a slope failure can develop. Benching will have to be adjusted as necessary, in consultation

## GREENBAUM ASSOCIATES, INC. GEOTECHNICAL & MATERIALS ENGINEERS

with this office, where limestone bedrock is encountered that prevents benching as shown from being achieved



Soil fill must be no steeper than 2 horizontal to 1 vertical in order that it remain stable. Where there is a sharp angle in the slope, such as near the corner of a building or pavement corner, the slope must be no steeper than 2.5 to 1. If the slope is to be mowed with normal lawncare equipment, it should be no steeper than 3 to 1. This survey is intended to address existing slopes at this site. This is not a geotechnical investigation and does not include any boring, laboratory testing nor modeling of slope stability to determine factor of safety against sliding.

If you have any questions regarding this study, please call.

Sincerely,

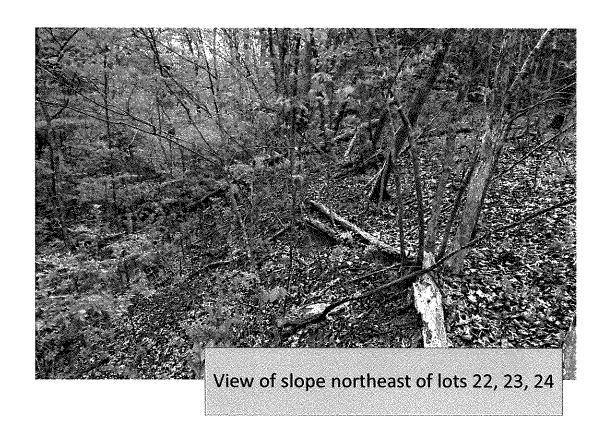
**GREENBAUM ASSOCIATES, INC.** 

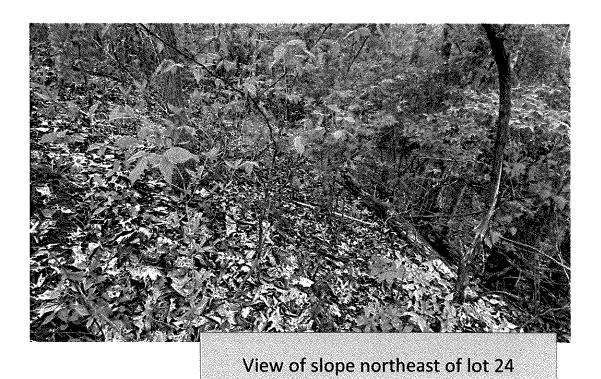
Luke Van Nevel, E.I.T. Engineer-in-Training

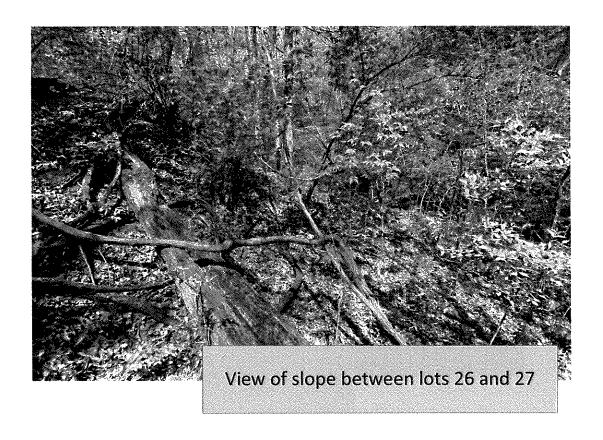
Luka Vam Nevel

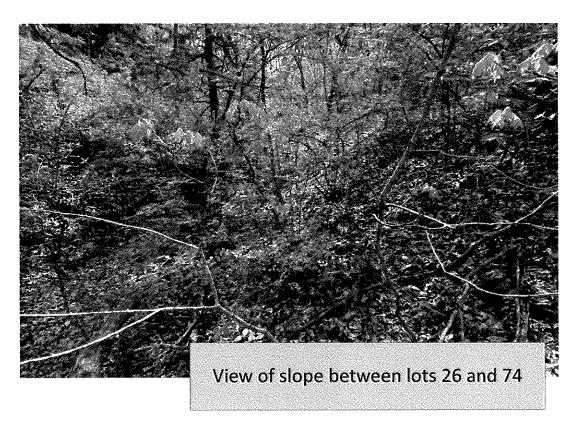
Sandor R. Greenbaum, P. E. Principal Engineer

Sandor R. Greenbaum

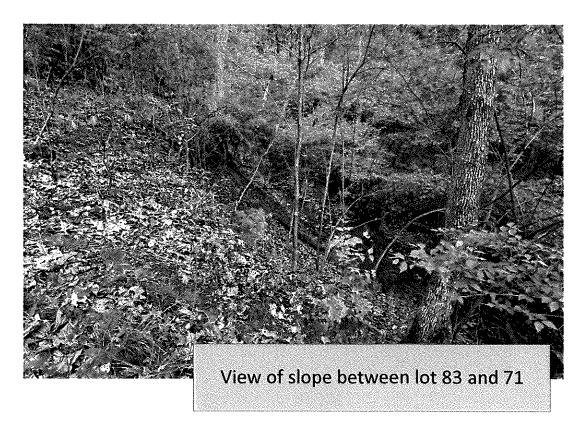


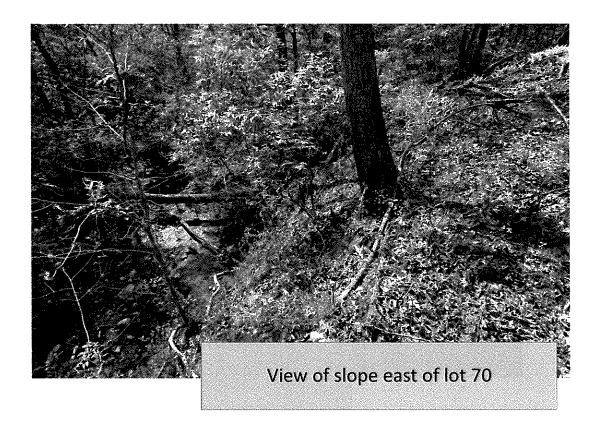


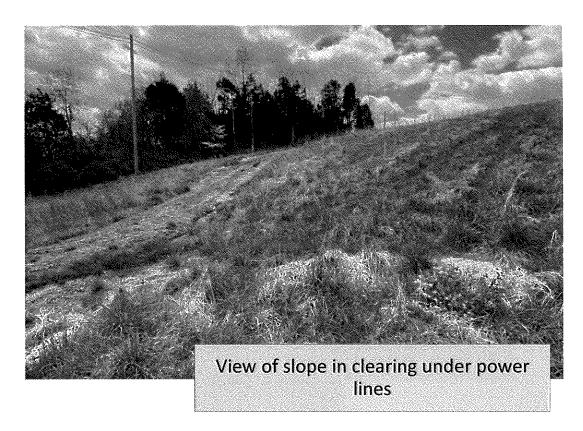


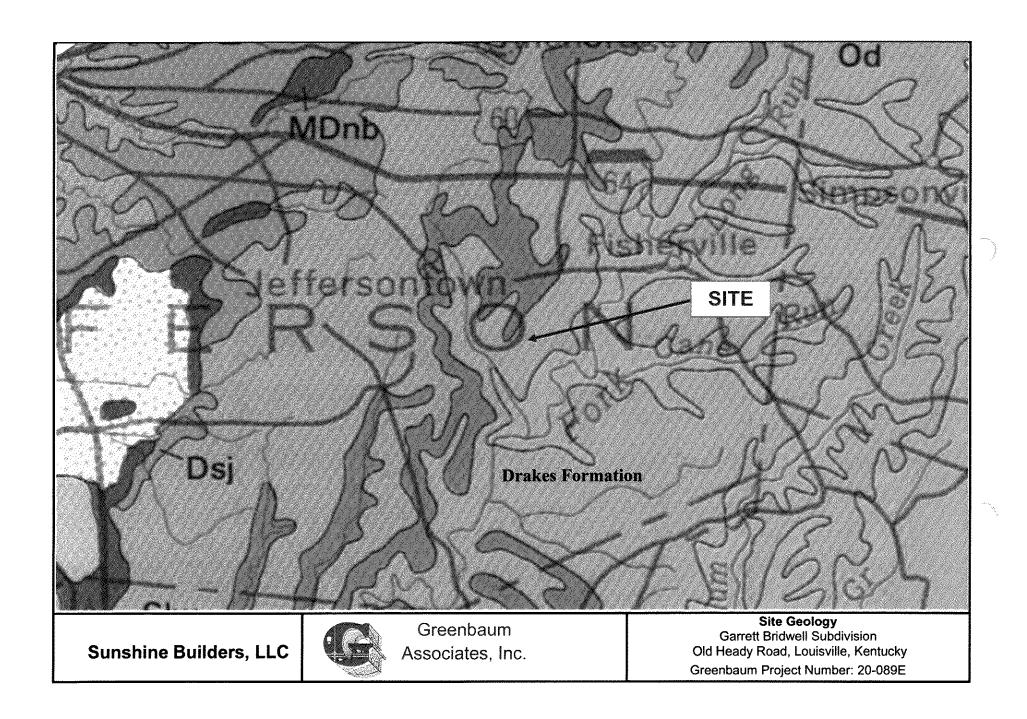












### Docket No. 21-ZONEPA-0002

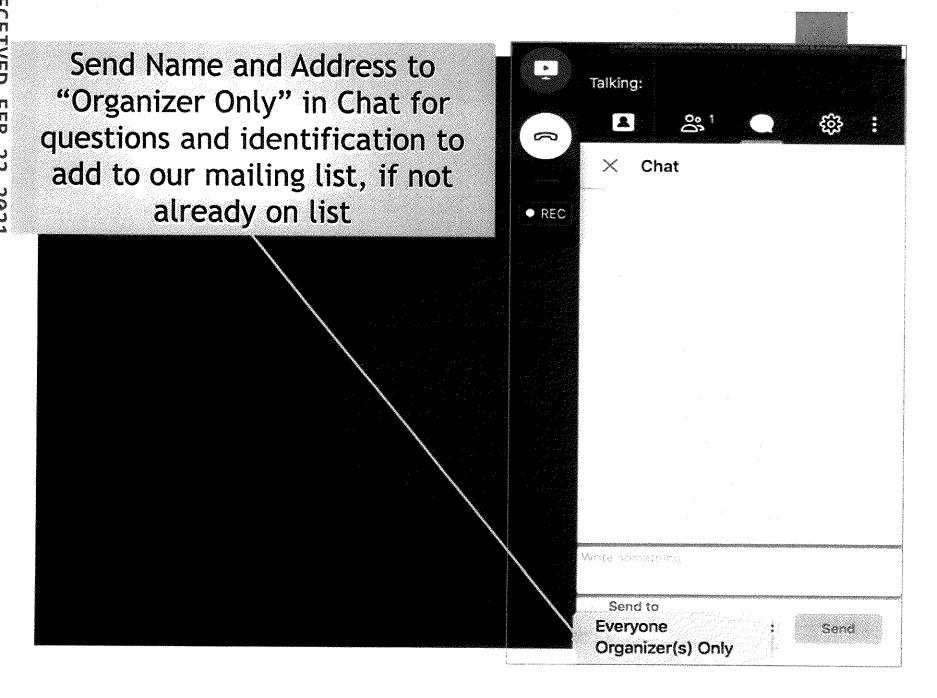
(Dante St. Germain, DPDS Case Manager)

Zone change from R-4 to R-5 & R-5A to allow a 111 lot single family subdivision and 30 patio homes on property located on the north side of Old Heady Road, along and west of I-265

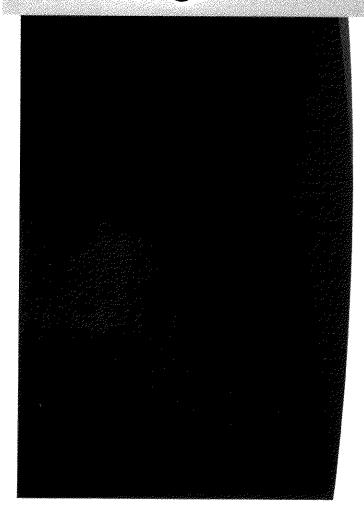
Blankerton Old Heady Development, LLC d/b/a Sunshine Builders, LLC

Attorneys: Bardenwerper Talbott & Roberts, PLLC

Land Planners, Landscape Architects & Engineers: Land Design & Development, Inc.



### Neighborhood Meeting Letter



#### BARDENWERPER, TALBOTT & ROBERTS, PLLC

BUILDING INDUSTRY ASSOCIATION OF GREATER LOWISHIGS BLOG + 1000 N. HURSTROUPIN PARKWAY + SECOND PLOOF + LOUISVALE, KENTUCKY 40223

(502) 426-6688 - WINN JAMPELMUNET

William B. Bardenwerper beneft WERSHAKDIAN SET Nicholas R. Preglinaco

January 7, 2021

RE: Neighborhood meeting for a proposed residential subdivision comprising of both single-family lots and patio home condominiums through a zone change from R-4 to R-5 & R-5A on property located on the north side of Old Heady Road, along and west of I-265

Dear Neighbor:

We are writing to notify you about an upcoming "neighborhood meeting" regarding the above referenced project. Because of the COVID-19 emergency orders requiring and/or recommending social distancing, the neighborhood meeting will be held virtually. The details are set forth in this letter and the supporting attachments. If you cannot obtain access to the virtual meeting, we may be able to assist you in that regard or otherwise assure a telephone or in-person conversation.

Damon Garrett with Sunshine Builders, LLC is seeking approval of a preliminary subdivision plat and detailed district development plan and corresponding rezoning from R-4 to R-5 and R-5A on the property referenced above. The project is proposed to consist of 111 detached single-family lots and 30 attached patio homes on approximately 56 acres. As such, a plan will be filed for pre-application review with Metro Planning and Design Services (PDS) which will be assigned a case number and case manager. At time of the neighborhood meeting, that information will be provided to those attending and posted on the PDS portal referenced on one of the attachments hereto.

The virtual meeting will be held on Thursday, January 21st beginning at 7:00 p.m.

Enclosed for your review are the following:

- 1. The development plan and aerial photograph sheet
- 2. LOJIC site location zoning map sheet showing the location of the site
- 3. Detailed summary sheet of the project
- 4. Contact information sheet
- 5. Instruction sheet on how to join the virtual meeting.
- Information sheet on how to obtain case information online from PDS' online customer service portal.
- 7. PDS' "After the Neighborhood Meeting" sheet

If you are unable to attend the virtual meeting, or have any questions or comments, please feel free to email or call me, or contact the PDS manager listed on the attached contact information sheet.

We look forward to our opportunity to visit virtually or by phone.

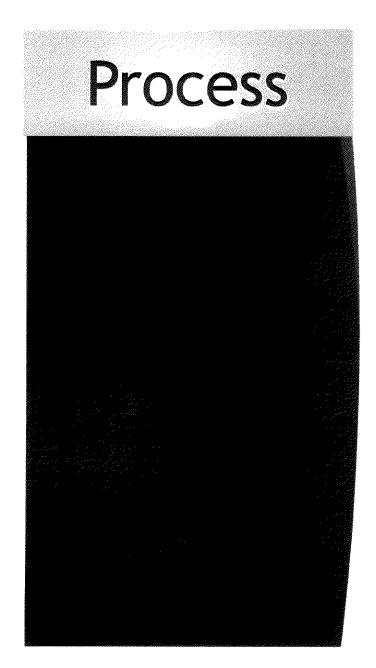
Sincerely.

Nicholas R. Pregliasco

ec: Hop/Stuart Benson, Councilman, District 20 Brian Davis, Planning & Design Manager

Derek Triplett, land planner with Land Design & Development, Inc.

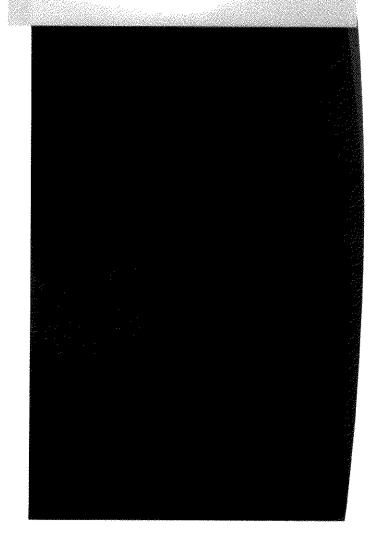
W. Damon Garrett, applicant with Sunshine Builders, LLC



- Pre-App Filing
- Neighborhood Meeting
- ▶ Formal Filing
- ► Land Development & Transportation Committee (LD&T)
- Planning Commission (PC)
- Metro Council

www.louisvilleky.gov/businessportal

# DPDS Case Manager Contact Information



# Dante St. Germain, AICP Planner II

Planning & Design Services
444 South Fifth Street, Suite 300
Louisville, KY 40202

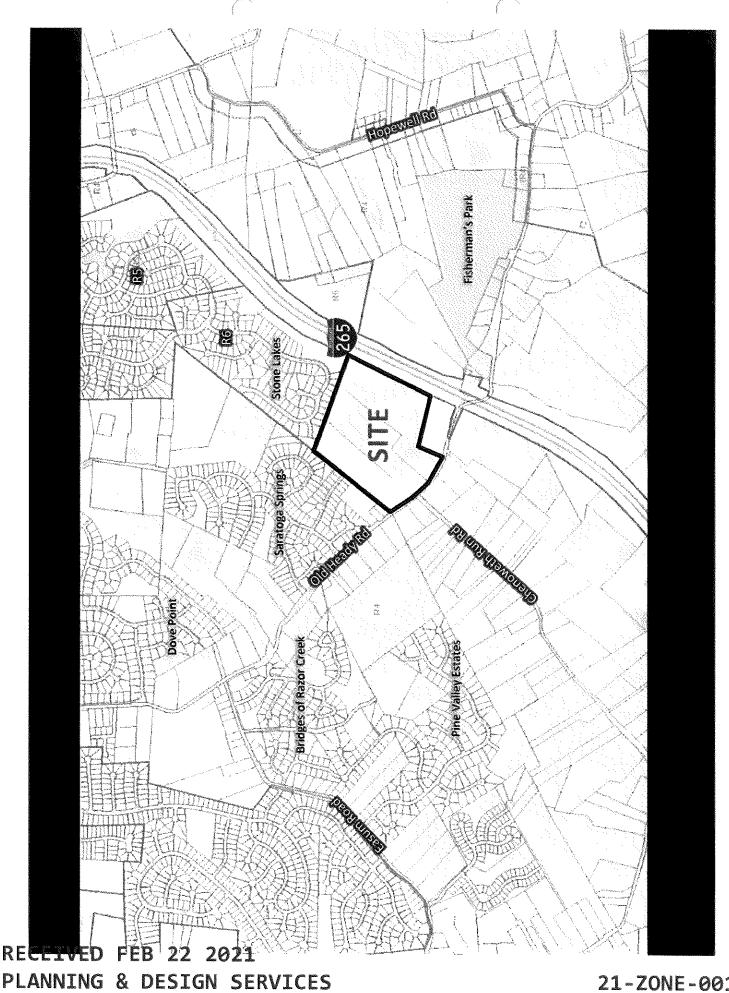
(502) 574-4388

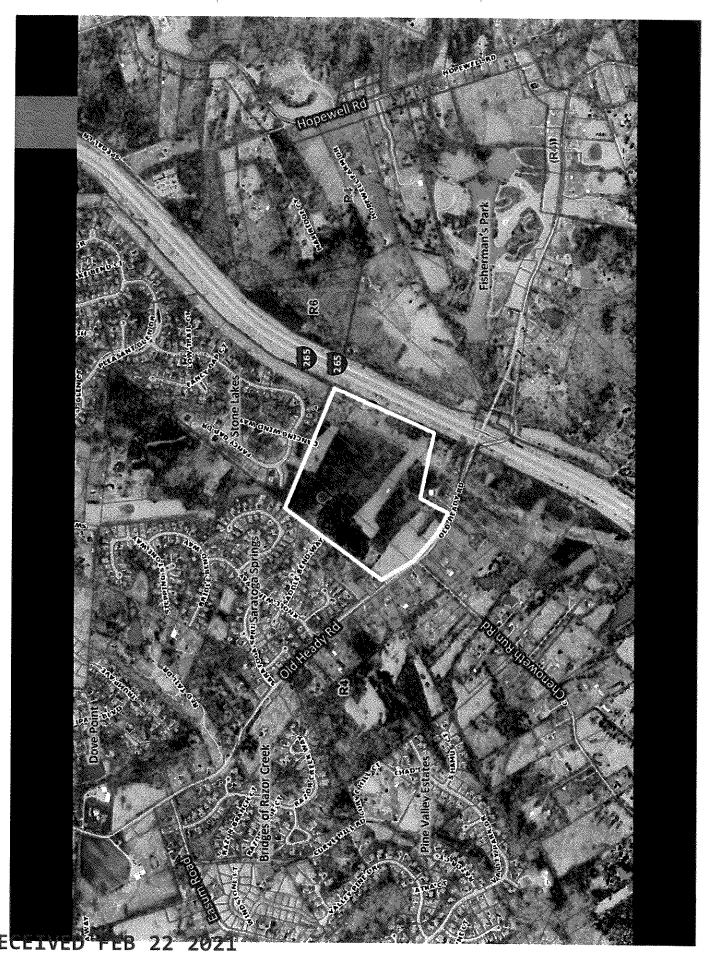
Dante.St.Germain@louisvilleky.gov

## NOTICE OF POTENTIAL CHANGES

- Please be advised that every effort is made to make the information today accurate, but it is subject to change and correction.
- Changes will likely be made to the development plan and use after various agencies and DPDS staff review the plan.
- ▶ Plan changes will be available for review with Louisville Metro Planning & Design's Online Customer Service Portal and at the time of the public hearing.
- ➤ You may also contact the DPDS case manager if you have any questions, or contact any others listed on the Contact Information Page where contact information is provided.

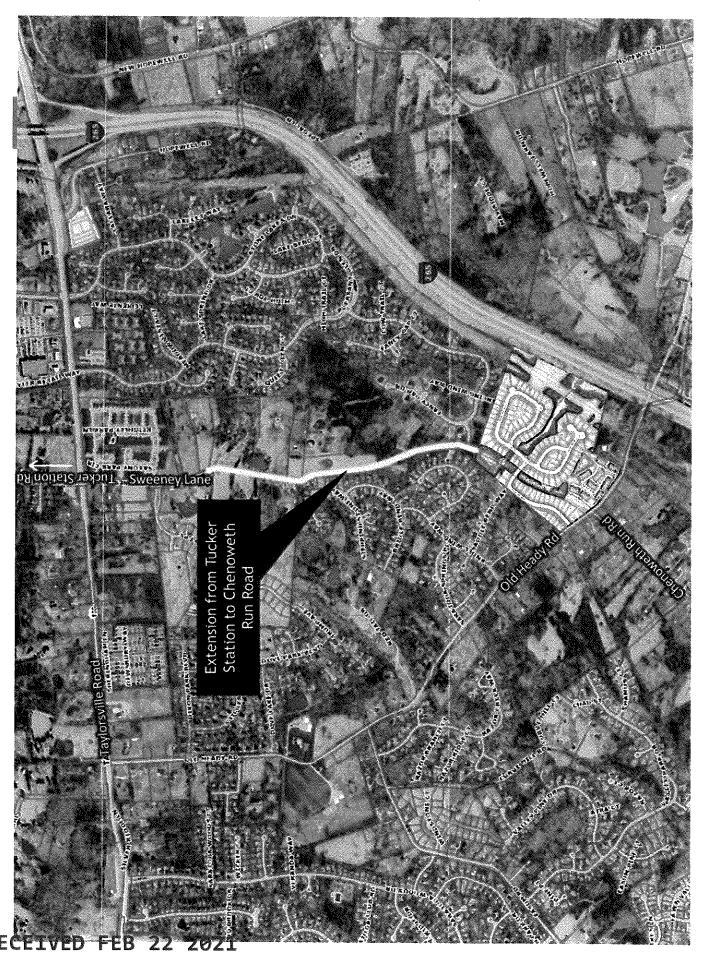


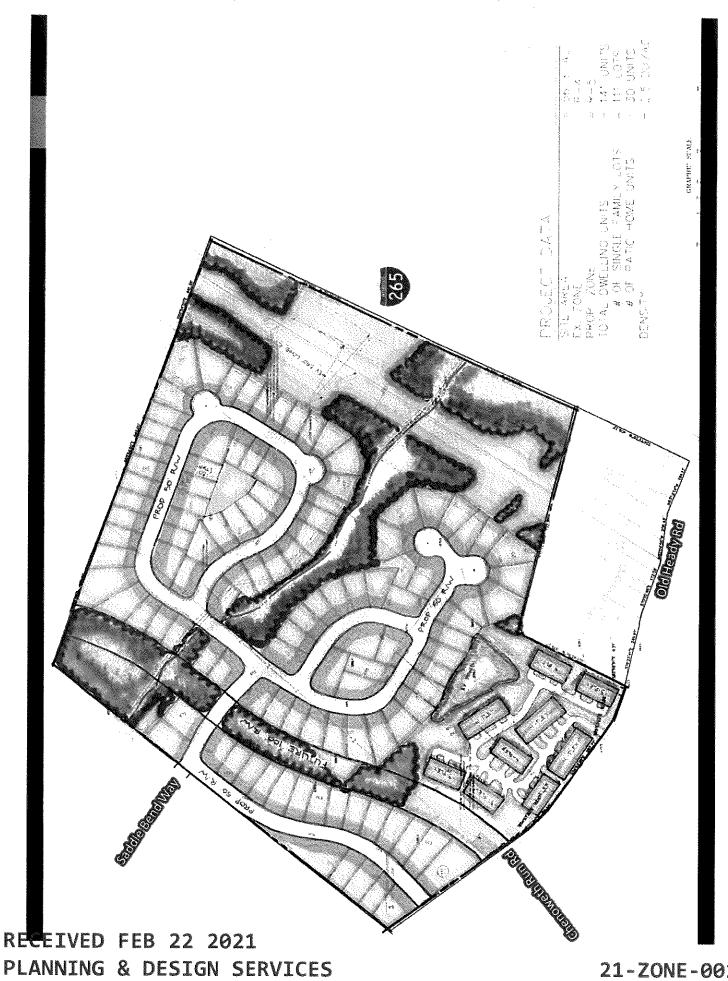






PLANNING & DESIGN SERVICES

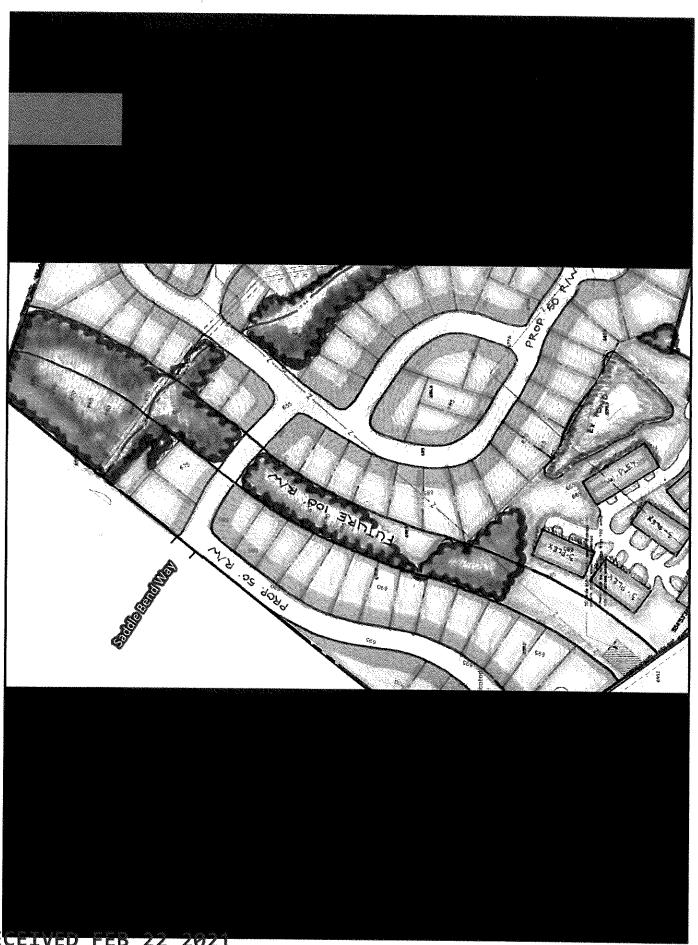


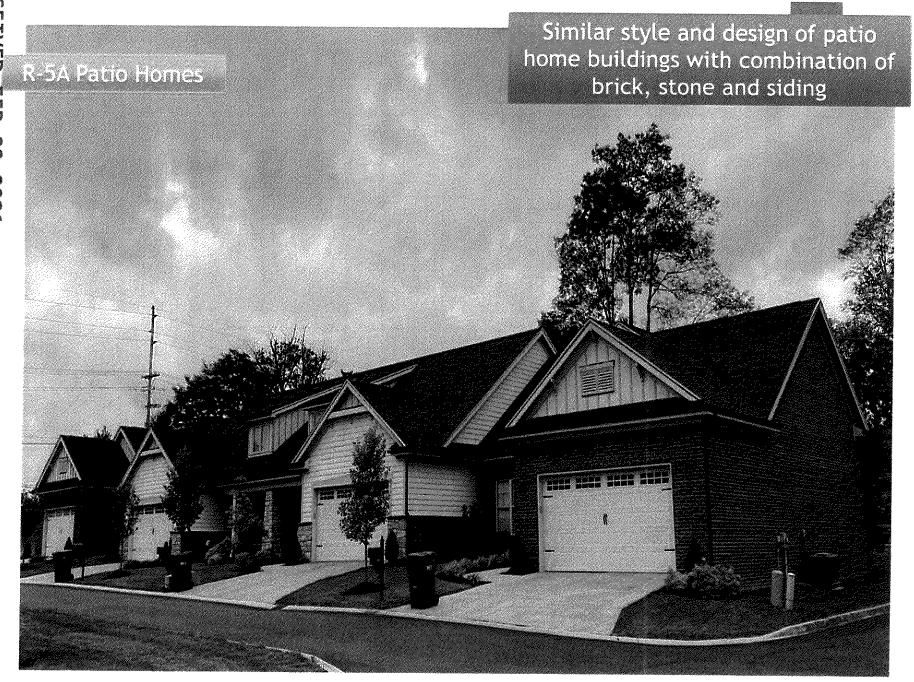


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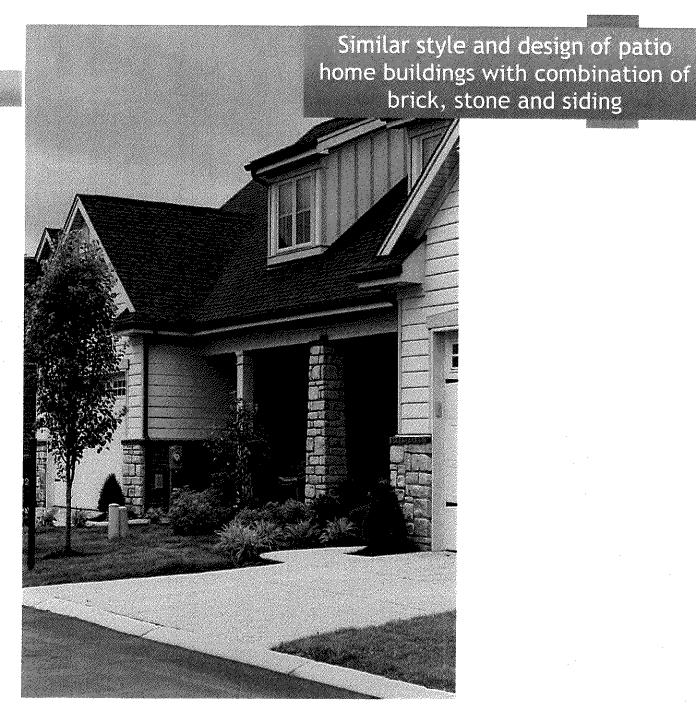


PLANNING & DESIGN SERVICES





R-5A Patho Homes

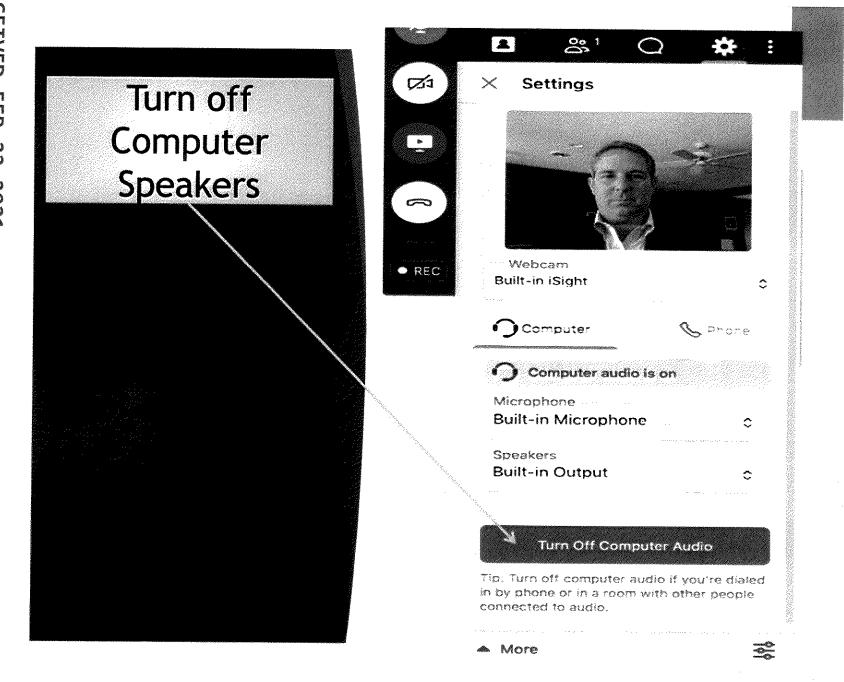


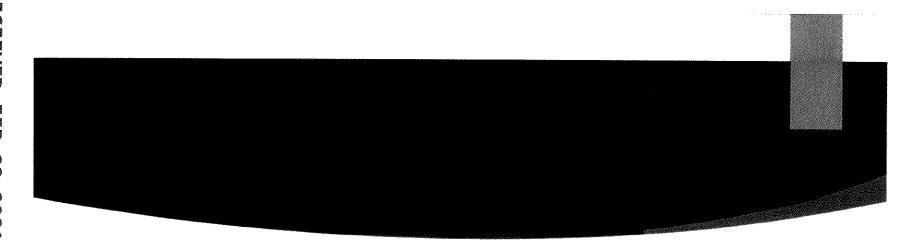








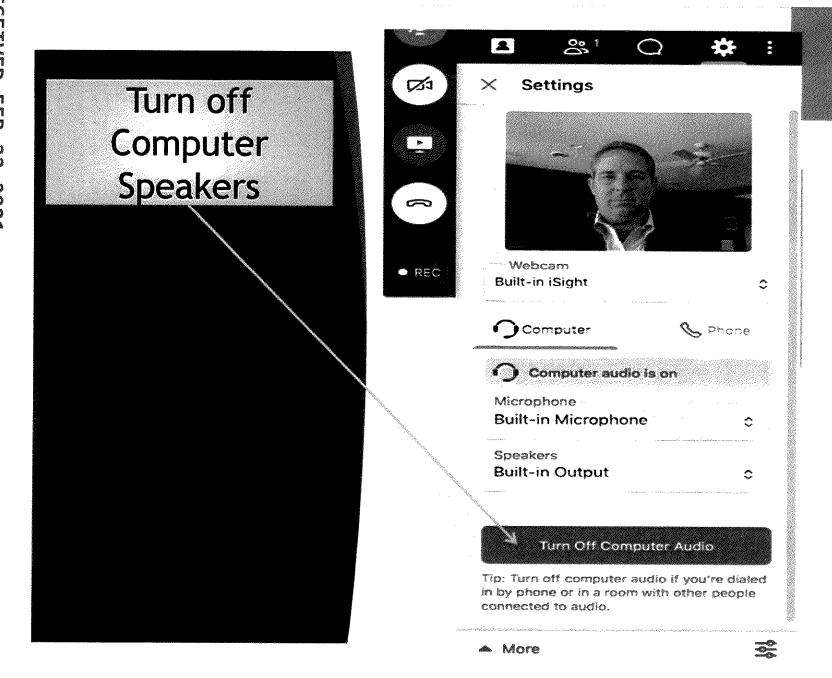


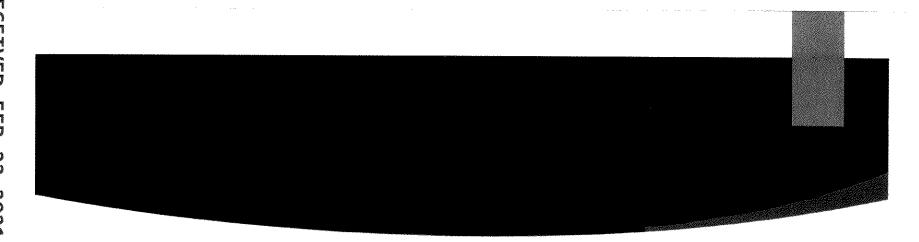


### Questions?

Please use the chat box feature and you will be called on one at a time.

If you did not receive a letter in the mail regarding this neighborhood meeting, please e-mail Anna Martinez at <a href="mailto:amc@bardlaw.net">amc@bardlaw.net</a> or call her at 502.426.6688 and she will add your name to the mailing list.





#### **Questions?**

Please use the chat box feature and you will be called on one at a time. If you did not receive a letter in the mail regarding this neighborhood meeting, please e-mail Anna Martinez at <a href="mailto:amc@bardlaw.net">amc@bardlaw.net</a> or call her at 502.426.6688 and she will add your name to the mailing list.