

APPENDIX X

Wetlands Impact Data



To: Don Connors, PE, AMEC
From: Kerrienne Zdimal, PWS, SME Environmental, Inc.
Date: December 2014
Project: US 550-US 160 Reconnect (SME Project No. 130019)
Re: Changes to Impact Calculations Based on Data Set – 1999-2000 Delineation Compared to 2013-2014 Delineation

Wetlands and other Waters of the United States (WOUS, as defined under the Clean Water Act [CWA]) within much of the study area were delineated in 1999 and 2000. The United States Army Corps of Engineers (USACE) concurred with this delineation in 2002, subject to final verification as specific projects are designed for construction, and it was cited by both the 2006 *US 160 EIS* and the 2012 *SFEIS*.

In 2013, SME Environmental (SME) assessed the 1999–2000 delineation in the field using global position system (GPS) technology; at the same time, SME also conducted a study of wetlands and other WOUS within the CR 220 corridor outside of the previous delineation study area. A number of minor changes become apparent when comparing the wetland data gathered during the 2013-2014 survey effort and the original 1999-2000 delineations. These changes are due to:

- The introduction of *Rapanos* Guidance, which identifies a more robust analysis for evaluating potential jurisdictional status of wetlands and other WOUS (see below)
- Changes in irrigation patterns of the streams and ditches within and adjacent to the study area over the past 13 years
- The absence of mapping of ditches and open waters in the 1999–2000 delineation*
- Changes in wildlife behavior, including beaver activity (e.g., dams, lodges)
- Improved location technology (the 2000 survey did not incorporate GPS technology)
- Better access to portions of the study area during the 2013–2014 study

*It was discovered that the original delineation neglected to include acreages for ditches and open water sources within the study area. All new wetland delineation work does include these acreages

The maps provided in the Methodology and Results of Wetland Delineation, prepared by SME (December 2013, revised July 2014), denotes the current boundaries of wetlands and other WOUS within the study area. As noted above, a majority of 1999–2000 boundaries have been revised. New identification numbers were established for each potential wetland and other WOUS identified in the 2013-2014 delineation. In preparing the referenced document, information from both the 1999–2000 and 2013 surveys, as well as 2014 aerial interpretation, were used to identify potential wetlands and other WOUS. The jurisdictional status of each identified aquatic resource was not denoted in the referenced report. Note that in preparation of the 2014 delineation report, SME conducted the necessary field work to document existing conditions where previous data and aerial interpretation was used for the July 2014 memorandum.

Changes to Impact Calculations Based on Data Set

The absence of mapping of ditches and open waters in the 1999–2000 delineation, as noted above, may also carry over to the impact calculations for each of the alternatives as demonstrated in Table 1 below. The preferred alternative, Revised G Modified, presented in the SFEIS was designed to about 25 percent. The first column in the table below outlines the impacts analyzed in the SFEIS which used the 1999/2000 data set. As previously discussed, irrigation ditches and some aquatic resources were not accounted for in the 1999/2000 survey. The calculation of impacts presented in the second column of the table below uses the boundaries of streams, ditches and ponds mapped during the 2013/2014 survey to adjust the 1999/2000 data set. Several of the wetland areas increased in size since the original survey, as can be seen using the 2013/2014 data. Comparing the 1999/2000 data (first column of impacts calculations) to the 2013/2014 data without streams, ponds and ditches (third column), this increase in wetlands is apparent. The last column of impact calculations is derived from the complete set of 2013/2014 data (refined boundaries of wetland and other WOUS) and is reflective of how the Revised G Modified (SFEIS) alignment impacts wetlands and other WOUS under existing conditions. This data is presented to set the foundation for an apples-to-apples comparison with the alignments evaluated in the 2014 Independent Alternatives Analysis prepared by AMEC.

Table1: Revised G Modified (SFEIS) Alternative Impacts to Potential Wetlands/Other WOUS

1999/2000 ID	2013 ID	1999/2000 Data <u>Acres</u>	1999/2000 with Additional Streams, Ponds & Ditches Estimated based on 2013/2014 Data		2013/2014 (w/o streams, ponds & ditches) <u>Acres</u>	2013/2014 Complete Data	
			<u>Acres</u>	<u>Linear Feet</u>		<u>Acres</u>	<u>LF</u>
			1b-9a ¹	39-1		<0.01	0.02
*	39-1a	N/A	0.01	229	0.00	0.01	229
1c-3a	*	0.01	0.01	N/A	N/A	N/A	N/A

1c-3b	39-11	0.00	0.03	N/A	0.01	0.01	N/A
2c-1 ¹	40-3	0.02	0.00	N/A	0.11	0.11	N/A
*	40-4	0.00	0.02	N/A	0.00	0.02	N/A
*	40-5	N/A	N/A	N/A	0.02	0.02	N/A
Total		0.03	0.09	583	0.14	0.19	583

*Water resources not delineated/identified in data set noted

¹ Determined non-jurisdictional in 1999-2000 but identified as potentially jurisdictional during the 2013 delineation

- Revised G Modified (SFEIS): The 1999/2000 data impact acreages and aquatic resources are from the SFEIS. Impact calculations (acreages and linear footages) identified in remaining columns are derived from SME evaluation of impact areas based on design information provided by CDOT/AMEC.
- Revised G Modified (SFEIS): The 1999/2000 data does not include the limits of two irrigation ditches mapped during the 2013/2014 field survey (39-1 and 39-1a). These resources were not likely included during the 1999/2000 field survey because the U.S. Army Corps of Engineers did not identify these types of aquatic resources as jurisdictional under the Clean Water Act prior to 2007 when the Rapanos Guidance was established. Note that the fringe wetlands along 39-1 were mapped as 1b-9a in 1999/2000 along approximately 70 linear feet of this irrigation ditch. As noted above, this accounts for approximately 583 linear feet of impact to a Relatively Permanent Waterway (RPW).
- Revised G Modified (SFEIS): The main increase in acreage; however, is due to two aquatic resources that were not previously identified (40-4, a vegetated stockpond; and 40-5, a PEM/PSS wetland) as well as the increase in previously identified area 2c-1 (40-3, a PEM/PSS wetland).

Presented below are impact tables from the 2014 Independent Alternatives Analysis prepared by AMEC. In the 2014 analysis alignments R5, RGM6 and RGM were developed to 30 percent design to more accurately define impacts, fully understand constructability issues and to form a basis for realistic cost estimates. Alignments R5 and RGM6 are new alignments; however, RGM is virtually the same alignment as the Revised G Modified (SFEIS) alignment. The 2014 analysis uses updated design data including geotechnical analysis that helped determine cut/fill slopes and wall parameters. Therefore, RGM will have slightly different impacts than the Revised G Modified (SFEIS) alignment based on more refined design.

Table2: R5 Alternative Impacts to Potential Wetlands/Other WOUS

1999-2000 ID	2013 ID	1999–2000 ID Permanent Impacts*		2013 ID Permanent Impacts*	
		Impacts (Acres)	Impacts (Linear Feet)	Impacts (Acres)	Impacts (Linear Feet)
1b-3, 1b-5	37-2	0.02	N/A	0.01	96
1b-6, 1b-7	38-1	0.02	N/A	0.14	N/A
1b-8	38-2	0.26	N/A	0.54	N/A
	38-2a		N/A	0.03	276
**	38-3	N/A	N/A	0.08	N/A
2c-2 ¹	39-10 ¹	< 0.01	N/A	0.01	N/A
**	39-12	N/A	N/A	0.02	144
1b-2, 1b-1, 1a-1, 1a-3	44-1	0.08	N/A	0.08	N/A
	44-1a	0.01	N/A	0.01	127
2c-1 ²	40-3	0.02	N/A	0.11	N/A
**	40-4	N/A	N/A	0.01	N/A
**	40-5	N/A	N/A	0.19	N/A
Total		0.41	N/A	1.23	643

*Total 2013 wetland impacts differ from the 1999–2000 impacts; see section 7.4.3

**Water resources not delineated/identified in 1999–2000

¹Identified as non-jurisdictional but mitigated under CDOT’s Wetland Program guidelines

²Determined non-jurisdictional in 1999–2000 but identified as potentially jurisdictional during the 2013 delineation

- R5: With the 2013/2014 data set, R5 results in 1.23 acre total impact to wetlands and other Waters of the US – broken down as 0.07 acre stream-ditch/643 linear feet; 0.09 acre pond; 1.06 acre wetland; and 0.01 acre roadside ditch (that meets the three parameters to be wetland but has no connection to other Waters; not likely to be JD under the CWA).
- R5: The 1999/2000 data includes a center line for Wilson Gulch within 1b-8 and 1a-1/1a-3; however, the impact calculation does not include linear footages for this resource. The 1999/2000 data also includes a portion of Gulch B (37-2); however, the impact calculation does not include linear footages for this resource. The bulk of impacts resulting from this alignment occur within this area.
- R5: The 1999/2000 data does not include the limits of two resources mapped during the 2013/2014 field survey (38-3 and 39-12). Feature 39-12, an ephemeral channel behind Eagle Block, is a resource type the U.S. Army Corps of Engineers did not likely identify as jurisdictional under the Clean Water Act prior to 2007 when the Rapanos Guidance was established. Feature 38-3 is a hillside wetland seep.
- R5: There was also a significant increase in acreage due to two aquatic resources that were not previously identified (40-4, a vegetated stockpond; and 40-5, a PEM/PSS wetland) as well as the increase in previously identified area 2c-1 (40-3, a PEM/PSS wetland).

Table3: RGM Alternative Impacts to Potential Wetlands/Other WOUS

1999-2000 ID	2013 ID	1999-2000 ID Permanent Impacts*		2013 ID Permanent Impacts*	
		Impacts (Acres)	Impacts (Linear Feet)	Impacts (Acres)	Impacts (Linear Feet)
1b-9a ²	39-1	<0.01	N/A	0.02	N/A
	39-1c	0.00	N/A	0.01	476
**	39-1a	N/A	N/A	0.02	321
1c-1 ²	39-8	<0.01	N/A	<0.01	N/A
1c-3a	**	0.01	N/A	N/A	N/A
1c-3b	39-11	0.01	N/A	<0.01	N/A
2c-1	40-3	0.02	N/A	0.11	N/A
2c-2 ¹	39-10 ¹	0.01	N/A	0.01	N/A
**	40-4	N/A	N/A	0.04	N/A
**	40-5	N/A	N/A	0.19	N/A
Total		0.05	N/A	0.40	797

*Total 2013 wetland impacts differ from the 1999–2000 impacts; see section 7.4.3

**Water resources not delineated/identified in data set noted

¹Identified as non-jurisdictional but mitigated under CDOT’s Wetland Program guidelines

²Determined non-jurisdictional in 1999-2000 but identified as potentially jurisdictional during the 2013 delineation

- RGM: With the 2013/2014 data set RGM, results in 0.40 acre total impact to wetlands and other Waters of the US – broken down as 0.03 acre ditch/797 linear feet; 0.04 acre pond; 0.32 acre wetland; and 0.01 acre roadside ditch (that meets the three parameters to be wetland but has no connection to other Waters; not likely to be JD under the CWA).
- RGM: The 1999/2000 data does not include the limits of two irrigation ditches mapped during the 2013/2014 field survey (39-1 and 39-1a). These resources were not likely included during the 1999/2000 field survey because the U.S. Army Corps of Engineers did not identify these types of aquatic resources as jurisdictional under the Clean Water Act prior to 2007 when the Rapanos Guidance was established. Note that the fringe wetlands along 39-1 were mapped as 1b-9a in 1999/2000 along approximately 70 linear feet of this irrigation ditch. As noted above, this accounts for approximately 797 linear feet of impact to a Relatively Permanent Waterway.
- RGM: Impacts to 0.01 acre of resource labeled 1c-3a by the 1999/2000 survey effort are not accounted for in the 2013/2014 impact tally because this resource is considered upland. It was identified by the 1999/2000 survey effort but not identified in 2013/2014 as it is a septic lagoon that has likely been filled in between the time of that survey and the 2013/2014 investigation.
- RGM: The main increase in acreage; however, is due to two aquatic resources that were not previously identified (40-4, a vegetated stockpond; and 40-5, a PEM/PSS wetland) as well as the increase in previously identified area 2c-1 (40-3, a PEM/PSS wetland).

Table 4: RGM6 Alternative Impacts to Potential Wetlands/Other WOUS

1999-2000 ID	2013 ID	1999-2000 ID Permanent Impacts*		2013 ID Permanent Impacts*	
		Impacts (Acres)	Impacts (Linear Feet)	Impacts (Acres)	Impacts (Linear Feet)
**	39-1b	<0.01	N/A	<0.01	77
1c-2a, 1c-2b	39-6a	0.26	N/A	0.15	N/A
	39-6b			0.11	N/A
**	39.7	N/A	N/A	<0.01	100
1c-1 ²	39-8	0.04	N/A	0.04	N/A
1c-3a	**	0.01	N/A	N/A	N/A
1c-3b	39-11	0.03	N/A	0.03	N/A
2c-1	40-3	0.02	N/A	0.11	N/A
2c-2 ¹	39-10 ¹	0.01	N/A	0.01	N/A
**	40-4	N/A	N/A	0.06	N/A
**	40-5	N/A	N/A	0.17	N/A
Total		0.37	N/A	0.69	177

* Total 2013 wetland impacts differ from the 1999–2000 impacts; see section 7.4.3

**Water resource not delineated/identified in data set noted

¹Identified as non-jurisdictional but mitigated under CDOT’s Wetland Program guidelines

²Determined non-jurisdictional in 1999-2000 but identified as potentially jurisdictional during the 2013 delineation

- RGM6: With the 2013/2014 data set RGM6, results in 0.69 acre total impact to wetlands and other Waters of the US – broken down as 0.01 acre ditch/177 linear feet; 0.24 acre pond; 0.43 acre wetland; and <0.01 acre roadside ditch (that meets the three parameters to be wetland but has no connection to other Waters; not likely to be JD under the CWA).
- RGM6: The 1999/2000 data does not include the limits of two irrigation ditches mapped during the 2013/2014 field survey (39-1b and 39-7). This resource was not likely included during the 1999/2000 field survey because the U.S. Army Corps of Engineers did not identify these types of aquatic resources as jurisdictional under the Clean Water Act prior to 2007 when the Rapanos Guidance was established.
- RGM6: Impacts to 0.01 acre of resource labeled 1c-3a by the 1999/2000 survey effort are not accounted for in the 2013/2014 impact tally because this resource is considered upland. It was identified by the 1999/2000 survey effort but not identified in 2013/2014 as it is a septic lagoon that has likely been filled in between the time of that survey and the 2013/2014 investigation.
- The main increase in acreage is due to two aquatic resources that were not previously identified (40-4, a vegetated stockpond; and 40-5, a PEM/PSS wetland) as well as the increase in previously identified area 2c-1 (40-3, a PEM/PSS wetland).

Based on the above, the alternatives generally follow the same order of progression with the 1999/2000 data to the 2013/2014 data. With the inclusion of irrigation ditches that were not considered by the USACE to be jurisdictional under the CWA at the time of the 1999/2000 survey combined with the increased size of several mapped wetlands and the inclusion of open waters, we feel the above demonstrates how the increase in proposed impact has resulted from the Revised G Modified (SFEIS) alignment to the RGM alignment evaluated in the 2014 Independent Alternatives Analysis.

Using the 1999/2000 data, the Revised G Modified (SFEIS) increases from 0.03 acre of wetland impacts to 0.05 acre of impact as presented in the 2014 Independent Alternatives Analysis where the refined design has been applied (RGM). Applying the 2013/2014 data set to the refined design (RGM) to calculate proposed impacts, the result is an increase from the 0.03 acre presented in the SFEIS (Revised G Modified) to 0.19 acres (including 583 linear feet of ditch) presented in the 2014 Independent Analysis (RGM). For apples-to-apples comparison, the tables above include impact calculations for the R5 and RGM6 using both the 1999/2000 and 2013/2014 data sets.