Dieter, Gail A (DEC)

From: Brian.Carling@CH2M.com
Sent: Friday, June 12, 2015 4:52 PM
To: Dieter, Gail A (DEC)
Cc: cibrikje@dow.com; Kurt.Mehigh@CH2M.com; William.Andrae@CH2M.com
Subject: HCC - Waterloo - Gorham Street Tech Memo
Attachments: Final_Dow WAT_Post Dredge_Verification Tech Memo_6-12-15.pdf; Figure 1 - GS - Sediment Core Verification.pdf; Figure 2 - GS - Sediment Thickness Map.pdf; Figure 3 - GS - Post-Dredge Sediment Remaining.pdf; Figure 4 - GS - Redredge Area.pdf; Figure 5 - GS - Final Dredge Completion Surface.pdf

Hi Gail:

Attached is the final Gorham Street Tech Memo for your review. We appreciate the opportunity to get on the phone earlier to discuss the key components – sorry that couldn't have everything assembly in a more cohesive manner at that time. AS noted on the call:

1) The final design estimated 5000 cu yds in the Gorham Street deposit and the remedial efforts resulted in removal of ~4300 cu yds
2) We could not remove the sediment in the 20' offset for the gas line and the Gorham Street bridge area; however, the volume in those areas was estimated at ~1000 yards so the removal was very effective in removing the remainder of the estimated 5000 cu yds
3) The glacial till was encountered throughout the deposit and was the basis for refusal in most areas; rock was present in select areas but was not as prevalent as in North Shore
4) Removal of recoverable sediment is complete, anything that remains above the design elevation is glacial till or rock

Thanks

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Sediment Post-Removal Verification Report, Former Hampshire Chemical Corp. Facility Area of Concern A — Sediment Removal Project – Gorham Street Area Report, Waterloo, New York

PREPARED FOR:	Hampshire Chemical Corp.	New York State Department of Environmental Conservation
PREPARED BY:	CH2M HILL	
DATE:	June 12, 2015	
PROJECT NUMBER:	482750	

This memorandum summarizes the dredging and post-removal verification process that was performed in the Gorham Street Deposit at the Former Hampshire Chemical Corp. (HCC) site, Area of Concern (AOC) A – Cayuga-Seneca Canal sediment removal project in Waterloo, New York. AOC A is a portion of Cayuga-Seneca Canal (canal), which also is known as the Seneca River and is part of the New York State canal system. The portion of AOC A where corrective measures are being performed is separated into three sediment depositional areas referred to as the North Shore Deposit, the Gorham Street Deposit, and the Downstream Deposit (Figure 1). This Technical Memorandum is focused solely on the dredging and verification process used in the Gorham Street Deposit.

Dredging Summary

CH2M HILL contracted OpTech (now NRC) of Great River, New York to conduct the AOC A sediment removal project. OpTech contracted with the Faust Corporation of St Clair Shores, Michigan to conduct the water side dredging operations while NRC focused its resources on the land side sediment dewatering and waste management operations.

Dredging within the Gorham Street deposit was initiated on October 30, 2014 and continued through December 3, 2014 resulting in the removal, dewatering and disposal of approximately 3043 cubic yards (in-situ measurement) of sediment. Dredging at the Gorham Street deposit encountered a rock ledge on the north edge of the deposit. Refusal on rock was common along this feature and the dredger documented the areas of rock refusal to the degree possible using bucket refusal locations to further define the areas where removal was not possible. As dredging progressed, it was observed that unanticipated shallow refusal occurred over the majority of the deposit. A study of available surficial geology maps indicated that the area could be underlain with glacial material (lacustrine silts and clays or glacial till). A limited coring program was initiated on April 9-10, 2015 with the overall objective of determining if the material causing refusal within the Gorham Street deposit is soil of glacial origin. Per the project – specific workplan, refusal on till would constitute completion of dredging in the Gorham Street Dredge Management Units (DMUs). Six cores were advanced within the Gorham Street deposit, four were located within the GS-2 DMU and two additional borings were positioned with GS-1 which is referred to as the “finger”. Glacial till was encountered within all of the borings in the Gorham Street deposit and consisted of low permeabilty, pale reddish brown, very high plasticity, hard and dense silt and clay that contained clasts throughout the core. The grain size distribution data from these locations indicate that the percent fines outweigh the sand and gravel classification further supporting the presence of till in the shallow refusal areas.

From December 2-8, 2014, Affiliated Researchers (AR), a subcontractor to CH2M, conducted an interim post-removal, poling survey to estimate the remaining sediment within the Gorham Street deposit. Due to frozen canal conditions between December 2014, and early April 2015, the interim post-removal multi-beam

bathymetric survey wasn't conducted until April 23, 2015. The post-dredge bathymetric and poling data were compared to the pre-removal data to determine the thickness of soft sediment remaining in the area. The pre-removal bathymetric surface is presented on Figure 2 and shows the feet of sediment present before implementation of the removal. The interim bathymetric surface for the Gorham Street Deposit removal area is presented on Figure 3 which presents the amount of sediment remaining after removal. It was found that 1 to 3 feet of sediment remained in both DMUs. The above mentioned coring investigation determined that the soft sediment within the GS-2 DMU had been effectively removed and the apparent remaining soft sediment was actually glacial till. However, in the majority of the GS-1 DMU, soft sediment thicknesses of one-half to 1.5 feet remained on top of the glacial till surface and required additional removal. The remaining sediment removal area based on the initial bathymetric and poling data is presented as Figure 4.

From May 11, 2015 to May 27, 2015, an additional sediment removal was initiated in an effort to remove recoverable sediment present on top of the glacial till within the GS-1 and a small portion of the GS-2 DMU. The dredger completed this additional removal using the environmental bucket. Kris Keenan of NYSDEC was on-site to oversee a portion of the effort. This effort recovered approximately 1280 cubic yards of sediment within this area.

Verification Summary

On June 2, 2015, Affiliated Researchers (AR) of East Tawas, Michigan, a subcontractor to CH2M, conducted a final post-removal, multibeam bathymetric survey to estimate the remaining sediment within the Gorham Street Deposit. The post-dredge bathymetric data were compared to the pre-removal data collected prior to the start of removal activities and determined that the sediment removal was effective in removing the recoverable sediment within the Gorham Street deposit. The final bathymetric surface for the Gorham Street Deposit removal area is presented on Figure 5 and presents the amount of sediment remaining after removal; although design removal depths were not achieved across this entire area the glacial till underlies the entire deposit and represents the refusal surface throughout the deposit.

One additional feature worth noting is a 40-foot wide strip where the removal depth was not achieved; this anomaly is associated with a natural gas line that crosses under the canal. As discussed with NYSDEC prior to implementation of the remedy, a 20' offset was applied to each side of this known utility to minimize the potential to impact the natural gas line. Accordingly, removal was completed from the eastern edge of the "finger" to the eastern edge of the 20' gas line offset; no additional removal could be performed west of this point due to the risk of impacting the gas line and the Gorham Street Bridge.

Conclusion

The post-verification bathymetric survey indicates that the goals of the Gorham Street Deposit soft sediment removal have been achieved by removing soft sediment to the top of the glacial till layer. The re-dredging effort within the "finger portion" of the deposit and a smaller portion of the DS-2 near the north bank completed removal of the last portion of recoverable sediment, thus the removal objectives of the Gorham Street deposit have been achieved.

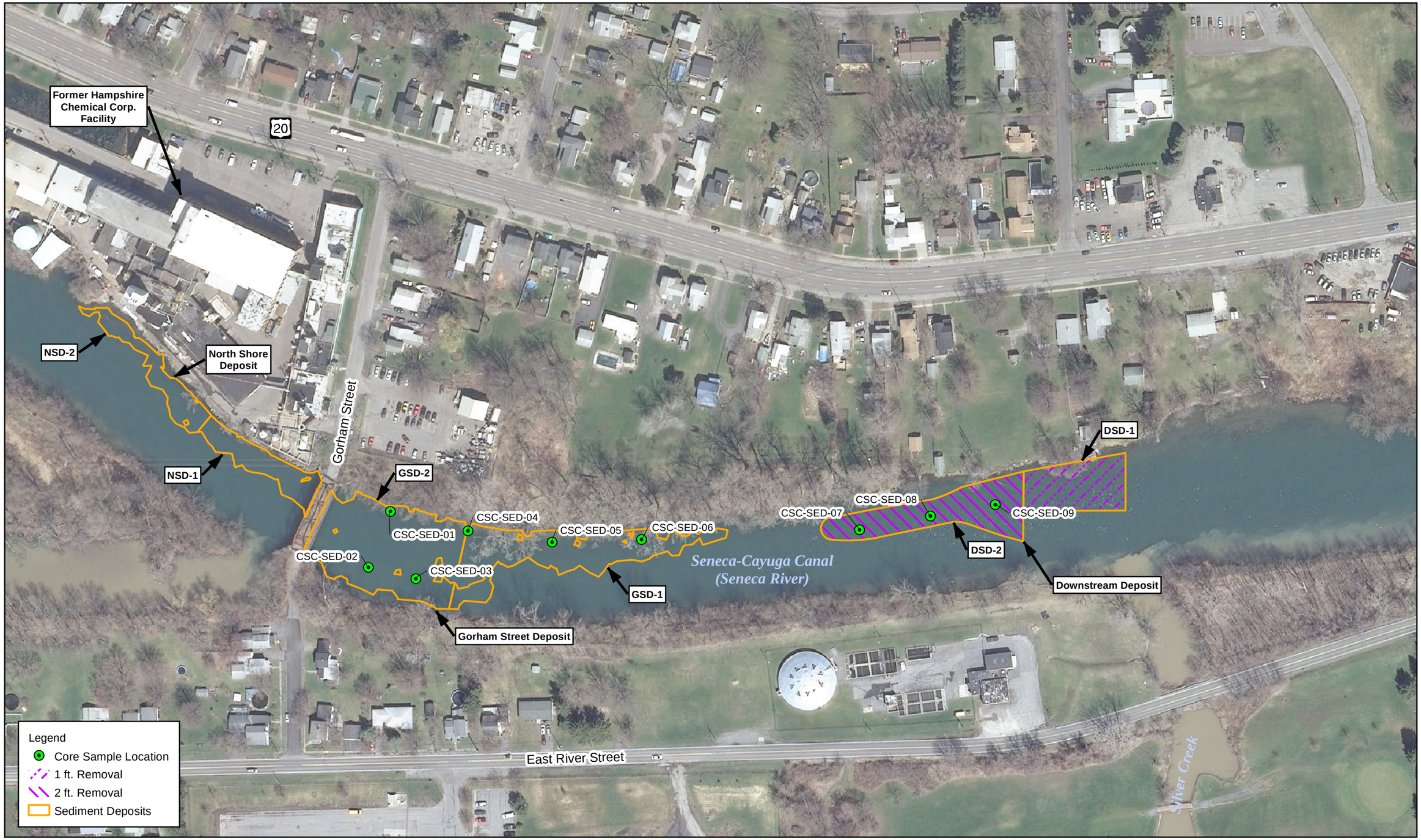

Figure 1
Sediment Core Verification Samples
AOC A Sediment Removal Verification Technical Memorandum
Gorham Street Deposit
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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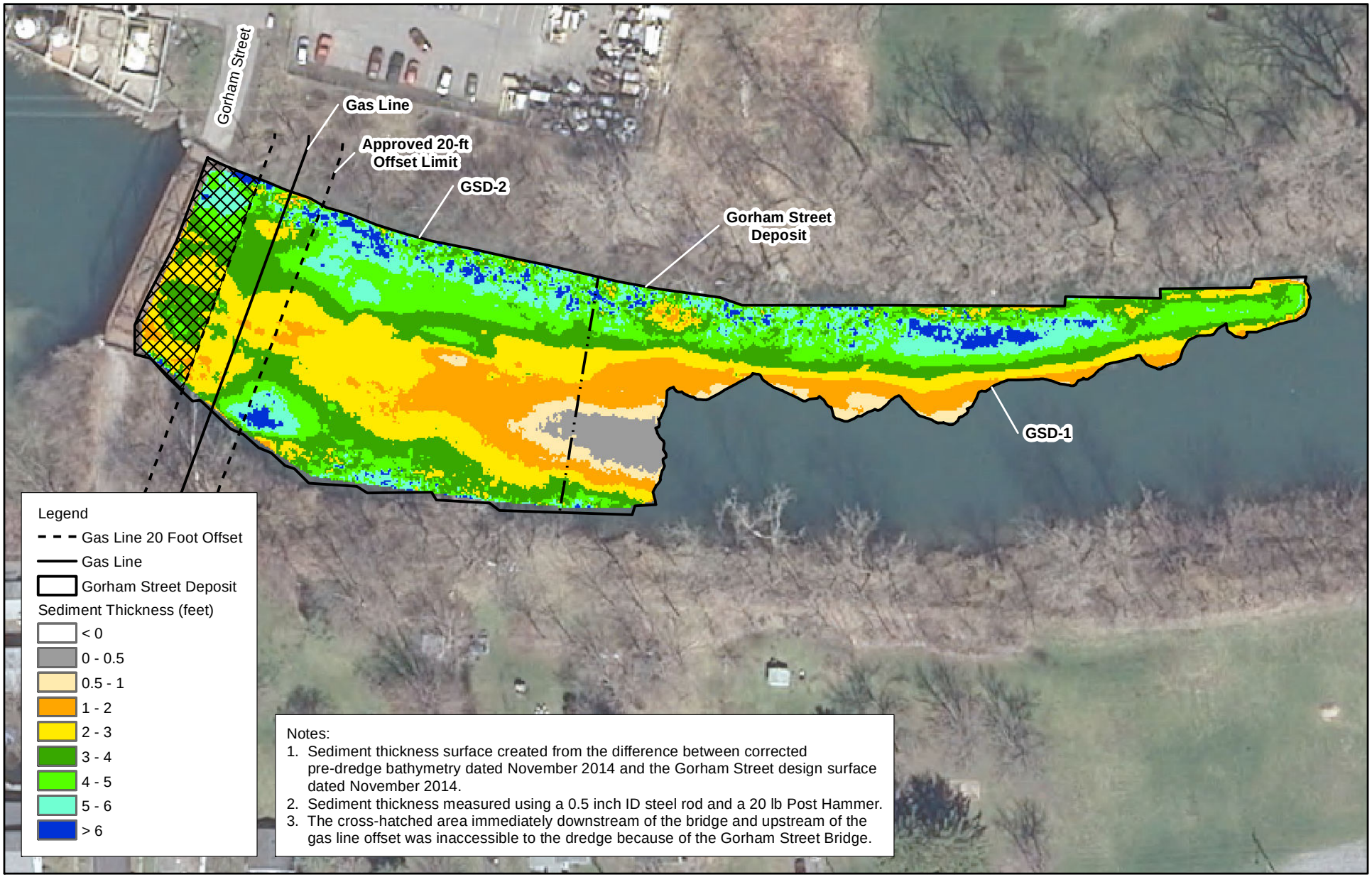

Figure 2
Sediment Thickness Map
AOC A Sediment Removal Verification
Gorham Street Deposit
Former Hampshire Chemical Corp. Facility
Waterloo, New York

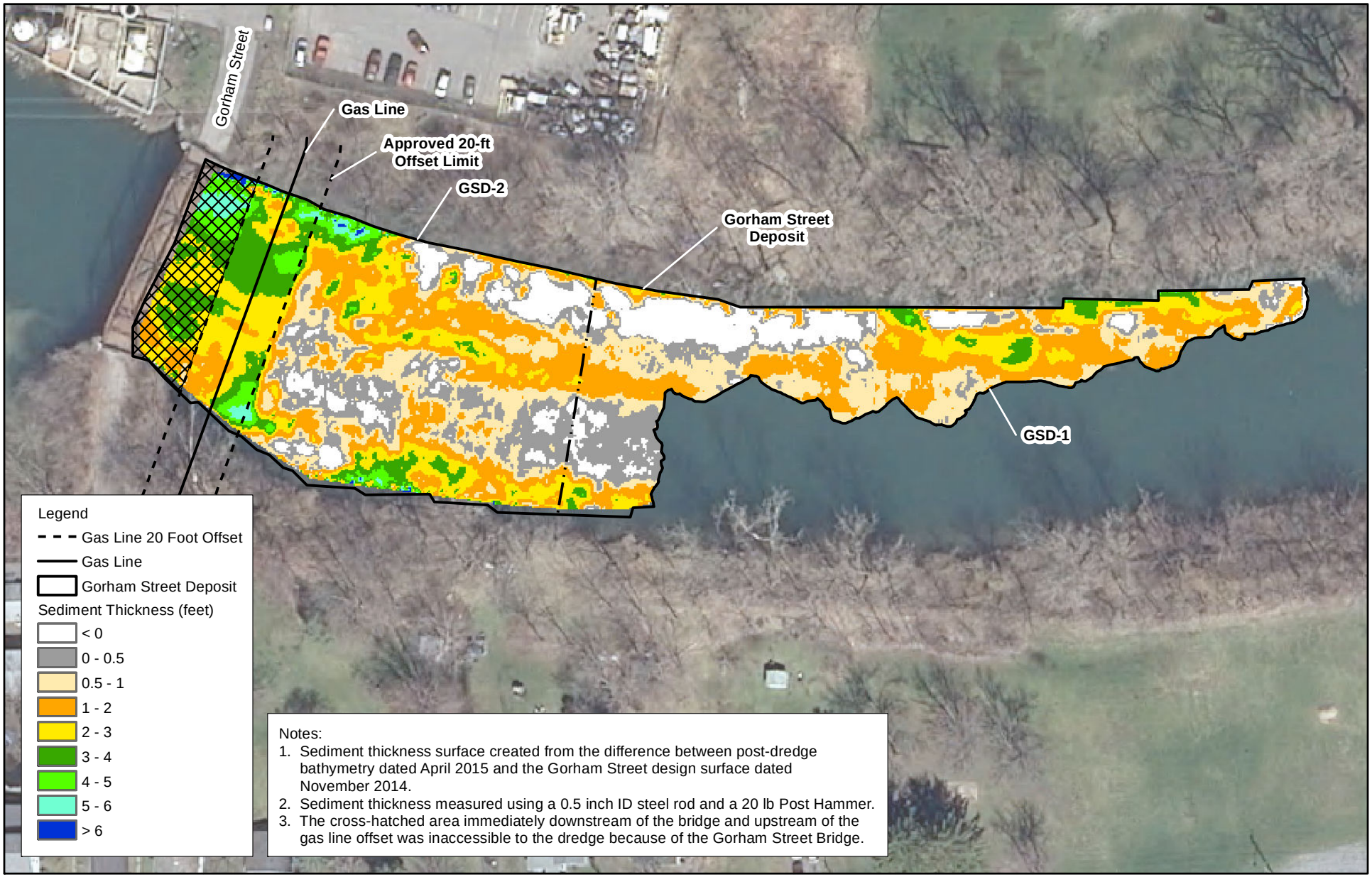

Figure 3
Post-Dredge Sediment Remaining
AOC A Sediment Removal Verification
Gorham Street Deposit
Former Hampshire Chemical Corp. Facility
Waterloo, New York

\\LAKEFRONT\PROJ\GIS\DOW\WATERLOO\REPORTS\2015\MAPFILES\AOC_A_SEDIMENTREMOVALVERIFICATION_TECHMEMO\GORHAMSTREET\FIGURE 3 - GS - POST-DREDGE SEDIMENT REMAINING.MXD JHANSEN1 6/12/2015 9:43:18 AM

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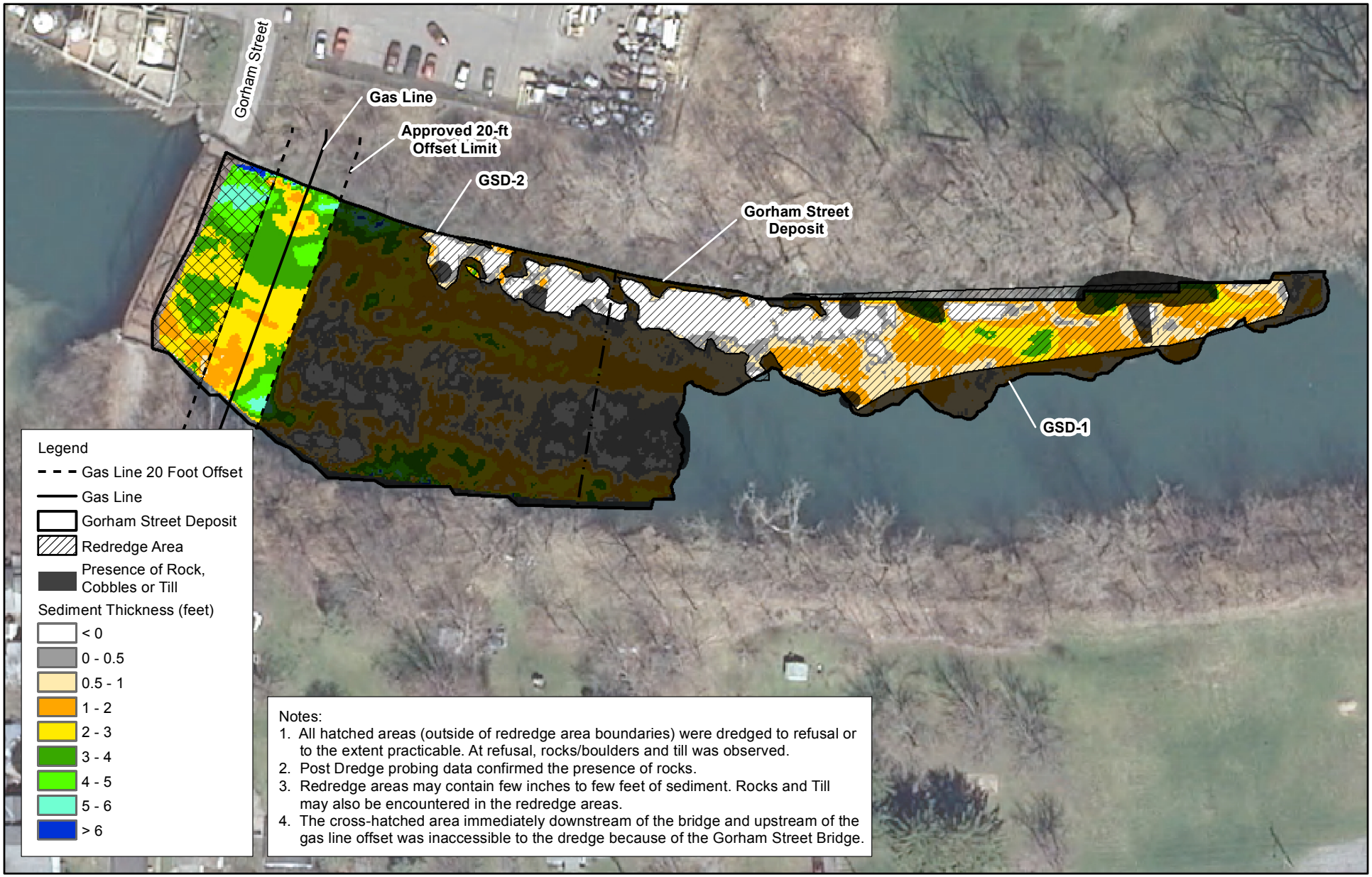

Figure 4
Redredge Area
AOC A Sediment Removal Verification
Gorham Street Deposit
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Waterloo, New York

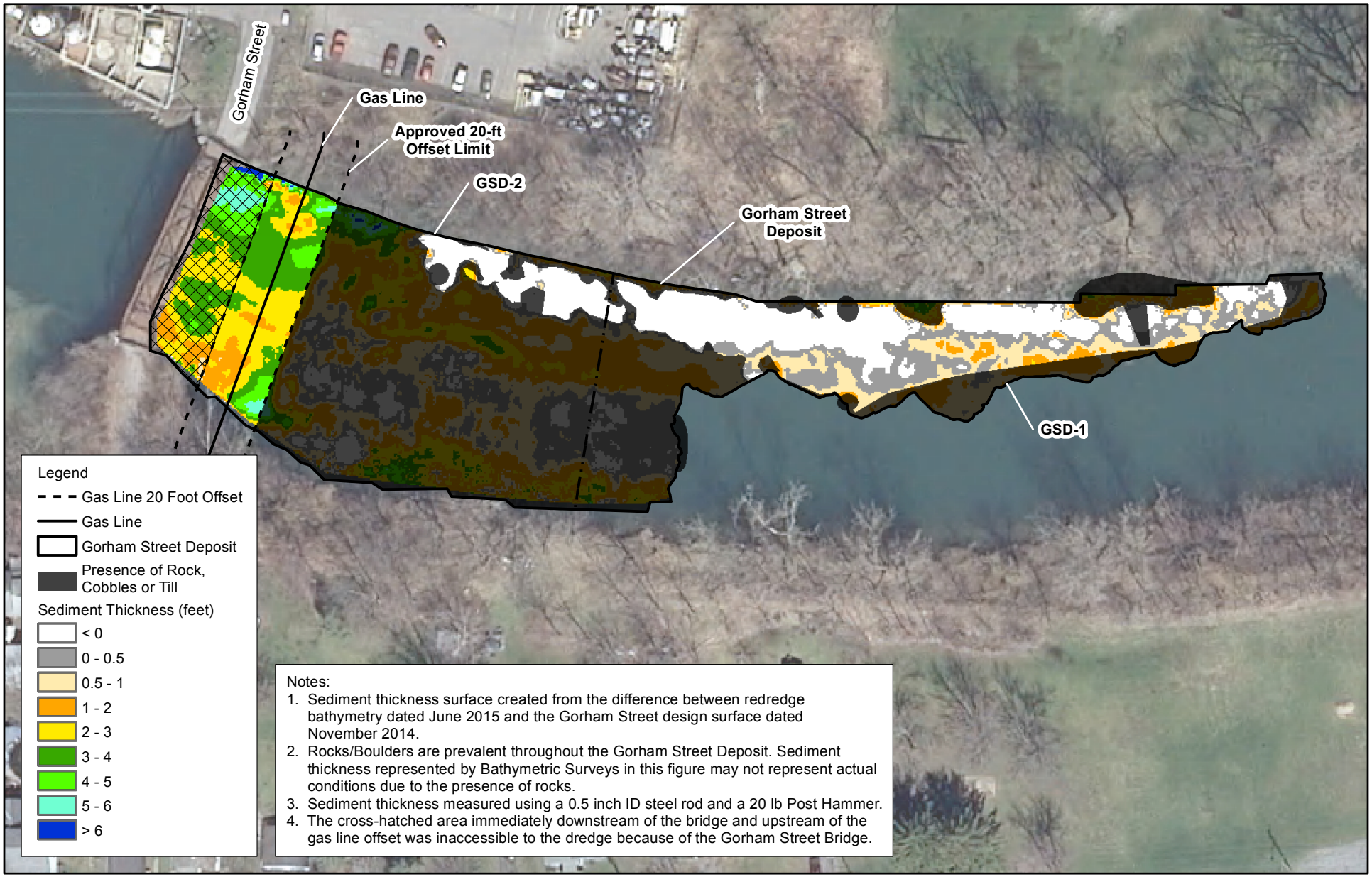

Figure 5
Final Dredge Completion Surface
AOC A Sediment Removal Verification
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