

# REMEDIAL DESIGN OU #3 100% DESIGN REPORT ADDENDUM

# VANADIUM CORPORATION OF AMERICA SITE TOWN OF NIAGARA, NEW YORK

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#### 1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has prepared this Addendum to the Remedial Design (RD) OU#3 100% Design Report (RD Addendum) for the Vanadium Corporation of America site (Site) in the Town of Niagara, New York. The RD Addendum presents modifications to the RD that are necessary to address revised design criteria provided by National Grid (N Grid).

During a conference call on August 25, 2011, N Grid raised the potential need to modify the final contours for the cap to accommodate potentially higher voltage transmission lines. N Grid followed up on January 11, 2012 with details for revised minimum clearance requirements under several of the transmission lines that will result in lowering the final cap elevations beneath the transmission lines. N Grid also requested the addition of seven crane pads and two pull pads to be located adjacent to transmission towers and a new access road to the crane and pull pads. Additionally, N Grid requested modifications to the design to provide additional space adjacent to the transmission towers for maintenance equipment and for drainage swales.

This RD Addendum presents the changes to the design along with revised Specifications (Appendix B), revised design drawings (Appendix C) and a revised Stormwater Management Plan (Appendix D) that reflect the changes.

#### 2.0 <u>REMEDIAL DESIGN AMMENDMENTS</u>

The components of the selected remedial alternative that require changes from the 100% RD are as follows:

- maximum allowable height restrictions
- subgrade and final grade contours
- cut and fill areas and volumes
- crane pad design and detail
- pull pad design and detail
- new access road
- site preparation
- surface water drainage

## 2.1 MAXIMUM ALLOWABLE HEIGHT RESTRICTIONS

The revised minimum clearance drawings that were provided by N GRID are presented in Appendix A. These were used to calculate the maximum allowable elevation beneath the transmission lines as presented on Drawing C-01. N Grid requires a minimum clearance of 32 feet between the bottom wire slag elevation and the final grade elevation. This is based on the Occupational Health and Safety Administration (OSHA) minimum clearance of 27 feet plus an additional 5 feet safety factor requested by N Grid.

#### 2.2 <u>SUBGRADE AND FINAL GRADE CONTOURS</u>

The final subgrade and final cap contours were revised to reflect the changes provided by N Grid and are presented on Drawings C-06 and C-07.

Based upon these contours, it is estimated that approximately 132,000 cubic yards of soil/slag within the proposed cap limits will need to be excavated from the designated cut areas (see Drawing C-05) and relocated within the fill area to achieve the revised subgrade contours. An estimated 7,700 additional cubic yards of sediment/soil will need to removed from areas of the Site outside of the cap footprint and placed within the area to be capped. Therefore the total estimated volume of material (soil, sediment and slag) to be excavated and placed with the cap footprint is approximately 139,700 cubic yards.

Based upon the difference between the proposed subgrade contours and the existing contours, the total volume of fill that can be accommodated within the cap footprint is 176,000 cubic yards. Hence the proposed subgrade contours will accommodate all of the proposed excavated material and allow for a 26 percent bulking factor. The top elevations of the mounds in the fill areas can be reduced should a lesser bulking factor be realized during construction.

#### 2.3 <u>CRANE PAD & PULL PAD CONSTRUCTION</u>

N Grid requested that seven crane pads and two pull pads be added to the design to allow for maintenance of the towers and transmission lines.

The proposed seven crane pads are located adjacent to transmission tower alignments 11, 12, 13, 14, 214, 7D, and 215. N Grid provided a cross section hand drawing that details the required crane pad construction and a copy is presented in Appendix A. The crane pad design detail is presented on Drawing C-16.

The crane pad from top to bottom will consist of:

- 12-inch NYSDOT compacted 12-inch aggregate size 2 Table 703-4 (aggregate 5)
- 16 oz/sy woven fabric geotextile
- 12-inch compacted fill

N Grid requested two pull pads in the cap footprint: one located north of tower alignment 12 and one located south of tower alignment 12. The proposed location north of tower alignment 12 includes an area with steep slopes that would be unsuitable for a pull pad. Through conversations with N Grid, it was agreed to split this pull pad into two smaller pull pads located on relatively flat ground.

The pull pad detail is presented on Drawing C-16.

The pull pad construction from top to bottom will consist of:

- 12-inch NYSDOT compacted 12-inch aggregate size 2 Table 703-4 (aggregate 5)
- 16 oz/sy woven fabric geotextile
- 12-inch compacted fill

#### 2.4 <u>NEW ACCESS ROAD LOCATION</u>

On January 11, 2012 N Grid requested the access road be relocated to provide access to each of the transmission towers and connect directly to the crane pads adjacent to the towers. The new access road location is presented on Drawing C-07.

#### 2.5 <u>SITE PREPARATION</u>

The revised location for the new access road requires additional tree removal at the south end of the Site. Drawing C-03 displays the revised area that will require tree removal.

#### 2.6 SURFACE WATER DRAINAGE

The remedial design includes changes to the drainage ditches and culverts to promote runoff from the Site. The new access road will require an additional three culverts to convey runoff from the Site. The location of each culvert is shown on Drawing C-07. Culvert 3A will be a 24-inch diameter HDPE pipe located at the south side of the cap and will be used to convey surface water from north to south under the access road west of tower alignment 13. Culvert 3B will be a 24-inch diameter HDPE pipe and convey runoff in the north to south direction under the access road located just west of tower alignment 12. Finally, culvert 3C will be a 24-inch diameter HDPE pipe and will convey surface water runoff in the east to west direction at the west side of the Site. The proposed culverts are detailed on Drawing C-21.

New drainage swales will be constructed along select crane pads and are designed to limit the amount of surface water ponding next to the transmission towers. One drainage swale will be located adjacent to the crane pad at tower alignment 12 and tower 214 and convey water from the crane pads to the pipe outlet at the west side of the Site. The other drainage swale will be located adjacent to the crane pads at tower alignment 13 and tower 215 and convey water from crane pads to the south edge of the cap. The detail for the drainage swales is presented in Drawing C-15.

#### 3.0 STORMWATER MANAGEMENT PLAN AMMENDMENTS

The Stormwater Management Plan (SWMP) amendment describes the supporting hydraulic calculation results for sizing the three new culverts (Culverts 3A, 3B, and 3C) and the two additional drainage swales based on a 2-year storm event. The post development modeling results taken from the 100 %RD providing a summary of the calculated Site runoff peak flows are presented in Table 1 of Appendix D. Also, Figure 4 from the 100 % RD detailing the post development catchment boundaries is presented in Appendix D. The new culvert sizing and design was completed using the software program "Bentley CulvertMaster" and the drainage swale sizing was verified using the software program "Bentley FlowMaster". The culvert and drainage swale calculation results are presented in Appendix D.



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VANADIUM CORPORATION TOWN OF NIAGARA, NEW YORK		CRA Infrastruct & Engineering,	ture Inc.
100% DESIGN REPORT ADDENDUM	Source Reference:		JULY 2012
	Project Manager: J. PUSKAS	Reviewed By: Designed By:   R. MEDSGER A. WESOLOWSKI	Drawn By: I. ROBERTSON
EAGAVATION AND GRADING PLAN	Scale: 1"=100'	Project No: Report No: 19867-30 027	Drawing No: C-05

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