

19 December 2002

AMEC Project No.: WX05476.2

Manitoba Conservation  
Environmental Operations Division  
Red River Region  
Suite 160 - 123 Main Street  
Winnipeg, Manitoba R3C 1A5

Attn: Mr. Randy Webber, Environment Officer



**Re: Remedial Action Plan**  
**Agricore-United Fertilizer Plant**  
**Austin, Manitoba**

## Introduction

As per the Information Bulletin (96-02E) *Contaminated Sites in Manitoba Submission of Remedial Action Plans*, AMEC Earth & Environmental Limited (AMEC), on behalf of GBM Consulting Inc. and Agricore-United, is submitting the following remedial action plan (RAP) for the Department's approval.

## Background

The subject property is a seasonal Agricore-United bulk fertilizer plant located along Highway No. 1, east of Austin, Manitoba. AMEC conducted a Phase II Environmental Site Assessment (ESA) of the property (reports dated 14 August 2002 and 14 November 2002) which determined that fertilizer (largely nitrate-N) impacted soil and groundwater were present on-Site in the storage and handling areas. The impacts affect an apparent on-Site area of approximately 3400 m<sup>2</sup>. The impacts appear to be limited to the shallow sand zone at depth of about 1.2 to 1.5 m below grade. While the extent of the impacts is defined on-Site, the impacts appear to have migrated off-Site to the southeast of the granular fertilizer operations. The off-Site impacts were not delineated as part of the assessment, however based on the extent of the on-site impacts and the soil profile identified in the area of the Site, the off-site impacts are expected to be confined to the public road allowance along the east of the Site.

Details of the work completed at the Site to date are detailed in the following reports.

- Phase II Environmental Site Assessment. Agricore-United Fertilizer Plant. SE33-11-11W, R.M. of North Norfolk, Manitoba. AMEC Earth & Environmental Limited. 14 August 2002.
- Phase II Environmental Site Assessment – Supplementary Investigation. Agricore-United Fertilizer Plant. SE33-11-11W, R.M. of North Norfolk, Manitoba. AMEC Earth & Environmental Limited. 14 November 2002.

The August 2002 report has been previously provided to the Department for review and the November 2002 report is attached.

## **Remedial Action Plan**

### Scope of Work

Based on the information provided in the above reports and in consultation with GBM Consulting Inc., AMEC proposes to inject commercial feed grade molasses into the nitrate impacted, saturated sand zone. The molasses injection will encourage the growth of the native heterotrophic bacteria populations which are expected to consume the nitrate impacts by the natural denitrification process. The goal of the molasses injection program is to reduce the nitrate concentration in the shallow groundwater zone to below the 1999 CCME guidelines for a community (potable) water supply. Within one week prior to the molasses injection process, an initial round of groundwater monitoring and sampling will be conducted to establish baseline conditions to which future monitoring and sampling events will be compared.

Ground Effects Environmental Services Inc. of Regina, Saskatchewan will perform the injection activities under supervision of AMEC. Based on work previously completed by Ground Effects which has been reviewed and approved by the Department, approximately 2700 kgs of molasses would be injected on an approximately 5 to 10 m grid (up to 70 injection points). The injection points would be placed within and slightly upgradient of the impacted areas including injection points to the southeast of the Site to deal with off-Site impacts. The groundwater gradient at the Site will be confirmed prior to the injection process. The injection activities would be conducted once weather conditions are favourable, which is expected to be in Spring 2003. It should also be noted that a second injection treatment may be required, depending on the effectiveness of the initial treatment.

The molasses injection process involves boring a hole by means of high pressure water injection through a lance (drill jet) into the affected zone at which point the lance would be set to inject the molasses solution horizontally (solution jet) through the impacted sand zone.

### Field Methods and Sampling

AMEC intends to monitor all eight of the existing on-Site monitor wells for pH, dissolved oxygen, conductivity, temperature, nitrates (by test strips) and groundwater depth. In addition to the monitoring, groundwater samples will be collected from each well and analysed for the following parameters:

- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Heterotrophic Plate Count (from three wells only)
- Total Organic Carbon (TOC)
- Total suspended Solids
- Total Dissolved Solids
- Nitrate, Nitrite and Ammonia
- Colour, Odour, Turbidity

As previously indicated, all the wells will be monitored and sampled within one week prior to the molasses injection. The wells will be remonitored and resampled approximately four weeks after the injection process and on at least one more occasion. The number of subsequent monitoring events will be dependant on the results of the initial monitoring and sampling events.

#### Reporting


On receipt of the initial baseline results, the results will be submitted to the Department for review. The results of the subsequent monitoring and sampling will be submitted to the Department on the completion of the field work (Fall 2003) along with details regarding the injection activities.

While not expected, if weather permits, the field activities may be conducted in late 2002. On approval of the remedial action plan, AMEC will provide the Department approximately one week notice of the injection process.

#### **Closure**

We trust that the information provided is suitable to allow MC to review and comment on the proposed remedial work. Should you have any questions or concerns please contact the undersigned.

Sincerely,  
**AMEC Earth & Environmental Limited**

A handwritten signature in black ink, appearing to read "Patrick Campbell".

Patrick Campbell, B.Sc. (E.Sc.)  
Environmental Scientist

Reviewed by:  
Harley Pankratz, P. Eng.  
Manager, Winnipeg Operations

ATT: Figures

cc: Addressee  
Mr. Blain Murray, GBM Consulting Ltd. (letter only)