Sebright Quarry
Updated Performance Monitoring Plan
Geographic Township of Dalton,
City of Kawartha Lakes

April 2011

Prepared for:
Giofam Investments Inc.
P.O. Box 1359
Uxbridge, Ontario L0C 1K0

Prepared by:
GENIVAR Inc.
1091 Gorham Street, Suite 301
Newmarket, Ontario L3Y 8X7

Project No. 920365.05

Distribution:
1 Camera Ready – Skelton Brumwell Associates Inc.
1 c File

GENIVAR

Project No. 920365.05

April 19, 2011

Mr. V. Giordano
President
Giofam Investments Inc.
P.O. Box 1359
Uxbridge, Ontario
L0C 1K0

Re: Sebright Quarry
Updated Performance Monitoring Plan
Geographic Township of Dalton, City of Kawartha Lakes

Dear Sirs:

We are pleased to submit the Updated Performance Monitoring Plan (PMP) for the Sebright Quarry.

Based on an assessment of hydrogeology, natural environment, and blasting, it is predicted that the development and operation of the Sebright Quarry will not have an unacceptable effect on the public or the environment. To evaluate the predictions a PMP is provided that will permit the collection of additional information, assess the effects to the public and environment based on established trigger mechanisms, and to allow for the design and implementation of contingency measures, if required.

We trust that this PMP provides sufficient detail for your consideration. Please contact the undersigned if you have any questions.

Yours truly,
GENIVAR Inc.

Jason T. Balsdon, M.A.Sc., P.Eng.
Consulting Engineer

JTB:lnc

1091 Gorham Street, Suite 301, Newmarket, Ontario L3Y 8X7
Telephone: 905-853-3303 • Fax: 905-853-1759 • www.genivar.com

Table of Contents

List of Tables

List of Figures

1. Introduction

1.1 Background

Giofam Investments Inc. proposes to licence and operate a quarry (Sebright Quarry) on its property located north of Kawartha Lakes Road 45 (former Highway 503), which is also known as Monck Road, about 6 kilometres (km) east of Sebright. The property is about 423 hectares (ha) in area and encompasses: Part Lots 18 and 19, Concession 3; Part Lot 17, and Lots 18 to 21, Concession 4; Part Lot 17, Lots 18 to 20, and Part Lots 21 and 22, Concession 5, within the Geographic Township of Dalton, City of Kawartha Lakes. A location map is provided in Figure 1.

Cranberry River flows through the northwest corner of the property, with the Queen Elizabeth II Wilderness Provincial Park (formerly the Dalton Digby Wildlands Provincial Park) located to the north and east. Figure 2 provides a regional plan of the property and surrounding area. The central portion of the property contains rock knobs that are topographically elevated above the surrounding area.

From 1992 to 2001 geology and resource testing of the granitic gneiss on the property was completed. Results are presented in the Geology and Resource Assessment (Jagger Hims Limited, 2008). Rock quality testing indicated that the granitic gneiss is capable of meeting the MTO HL1 specifications. A decision was made to proceed toward licensing a portion of the property. Giofam Investments Inc. proposes to obtain a Class A, Category 2 Licence for a quarry (Sebright Quarry) with extraction below the water table.

In June 2008, the new provincial Endangered Species Act came into effect. In response, additional field studies were completed with findings that necessitated revisions to the original Site Plan. For example the proposed extraction areas were reduced from four to two areas, with a reduced available resource of about 7.2 million m^3. As a result, the Hydrogeological Evaluation and Natural Environment reports were updated to consider the revised Site Plan and to include additional monitoring data obtained between 2007 and 2010. Therefore this Performance Monitoring Plan was also updated.

Based on the findings of the Natural Environment Report: Level 1 and Level 2 Assessments, Sebright Quarry (RiverStone Environmental Solutions Inc., 2011), portions of the property can be developed as a quarry without compromising the viability of the areas significant natural heritage features. After a review of the relevant environmental policy and legislation at federal, provincial, and municipal levels, RiverStone is of the opinion that the proposed quarry development plan will conform to these policies and provisions provided the recommendations contained herein are implemented. The required Official Plan and Zoning Amendments will allow for the proposed land use, while still preserving the Significant Natural Heritage Features identified on the subject property.

The Hydrogeological Evaluation of the Sebright Quarry (GENIVAR, 2011,) concludes that no off-site effects of quarry dewatering on groundwater elevations or quality are anticipated, except potentially south of Phase 2 where groundwater levels may decrease, based on 'worse-case conditions'. Dewatering effects between Phase 2 and Kawartha Lakes Road 45 will decrease with distance from the southern property boundary and should not have a negative effect on local water well supplies.

In addition, dewatering and other quarry operations will not have negative effects on surface water conditions within Cranberry River or on water leaving the Cranberry River subwatershed. With the

implementation of a water management plan the dewatering of Phase 1/2 and controlled discharge to the tributaries of the Cranberry River will not have a detectable effect on pre-extraction total surface water flow rates. It was predicted that the flow rates in the watercourses will be similar or may increase slightly during dewatering. No notable change in flow rates with Cranberry River will be detectable.

Upon completion of Phase 1/2, the rehabilitation will involve the establishment of a lake within the extraction area. Based on the existing topography, the lake level for Phase 1/2 will be about 240 metres above sea level (m asl). It is estimated that the lake will require about 30 to 40 years to achieve stable levels, but may be longer if some dewatering is required to supplement surface water flow within the central low-lying area and Watercourse 1. Upon complete rehabilitation of the site, the surface water and groundwater conditions will be similar to baseline conditions, with some reduction of groundwater seeps immediately around the rehabilitation lake. There will be no detectable effects beyond the property boundaries on groundwater and surface water conditions within the Cranberry River subwatershed.

The Blast Impact Analysis – Giofam Sebright Quarry completed for the quarry development (Explotech Engineering Ltd., 2011) concluded that blasting operations required for operations at the quarry can be carried out safely and well within governing guidelines set by the Ministry of the Environment. Modern blasting techniques will permit blasting to take place with explosive charges below allowable charge weights such that blast vibrations and overpressure will remain minimal at the nearest receptors.

To evaluate the predictions and to obtain input for the implementation of contingency measures, if required, this report was prepared to detail the Performance Monitoring Program to be completed for the site prior to, during, and for two years after achieving stable conditions within the rehabilitated lake. The monitoring program and trigger mechanisms to implement contingency measures are detailed in this report.

1.2 Objectives and Scope

The purpose of this Performance Monitoring Plan (PMP) is to provide a framework for a rational monitoring program for development and operation of the Sebright Quarry. As such, the objectives of this PMP are as follows.

- To provide technical guidance for personnel performing site monitoring during the active life of the quarry.
- To establish a groundwater and surface water monitoring program that will allow for the protection of the quantity and quality of water resources and for the protection of the natural environment and public water use.
- To provide a blasting monitoring program that will identify potential effects of blasting on the natural environment and the public.
- To provide a commitment to the public of a program that will detect potential effects from the quarry on the environment.

The PMP will be reviewed periodically and modified to reflect recommendations provided in regular monitoring reports and to include new data or changes in environmental requirements and regulations.

Input for the updated PMP was obtained from the following technical documents.

- Updated Sebright Quarry Hydrogeological Evaluation, prepared by GENIVAR Inc. (2011).

- Natural Environment Report: Level 1 and Level 2 Assessments, Sebright Quarry prepared by RiverStone Environmental Solutions Inc. (2011).
- Blast Impact Analysis – Giofam Sebright Quarry prepared by Explotech Engineering Ltd. (2011).

1.3 Document Format

The format of this PMP provides the monitoring programs for hydrogeology (groundwater and surface water), natural environment, and blasting as separate sections. Rationale is provided as required. Tables and figures are also provided to present monitoring details in a quick reference format. Document sections are as follows.

Section 2.0	Conceptual Quarry Development
Section 3.0	Hydrogeology
Section 4.0	Natural Environment
Section 5.0	Blasting

2. Conceptual Quarry Development

2.1 Hydrogeologic Setting

The Sebright Quarry is located along the southern fringes of the Canadian Shield, which consists of rock knobs and ridges with little soil cover that drain to local wetlands, lakes, and watercourses.

Estimated watershed boundaries of the property are presented in Figure 2. The main watershed in the study area is the Head River watershed, which also includes the Cranberry River subwatershed and Deverells Creek subswatershed. In addition, Dalrymple Lake and Young Lake discharge to Head River. The Black River watershed is located within the northwestern portion of the study area. Head River eventually joins Black River approximately 7.5 km northwest of Sebright, with ultimate flow into Lake Couchiching.

The property is located on a surface water drainage divide between Head River to the south and Cranberry River to the north. This drainage divide extends over areas of high land and rock knobs within the southern portion of the property. Cranberry River flows through the northwestern portion of the property, while Head River is located south of the property and Kawartha Lakes Road 45.

Groundwater levels and pressures within the bedrock are generally greater in the areas of high topography relative to the low-lying areas. Thus, groundwater in the bedrock moves toward the watercourses. The on-site testing and various depths of public water wells required to achieve a suitable quantity of water for residential use indicates that the groundwater movement within the bedrock is controlled by fractures. The depth of fractures with the ability to transmit sufficient water is not consistent spatially or with depth. Some watercourses may be recharged from shallow groundwater movement through the fractured rock. Static water levels at some locations suggest that surface water within some watercourses may be perched above the water levels within the surrounding bedrock.

Cranberry River flows through the northwestern corner of the property. This river is a perennial river and contains a number of rapids/falls as well as beaver dams upstream and downstream of the property. At

the location of the rapids/falls, the river directly overlies the bedrock. In other areas, the base of the river is located within the overburden or within sediment that overlies the bedrock. As shown in Figure 2 the catchment area for the river includes Cranberry Lake and numerous smaller lakes. The property is located near the downstream limits of the subwatershed.

There are two main intermittent tributaries of Cranberry River on the property that are located in the vicinity of Sebright Quarry. These tributaries are outlined below.

- Within the southwestern portion of the property the surface water runoff accumulates in a low-lying area (SWA) as a result of beaver activity and an access trail south of the low-lying area. This area discharges through a shallow watercourse past the western property boundary (SW4), which eventually discharges into Cranberry River about 400 m downstream of the property. This watercourse is designated as Watercourse 1. Station SW5 is located within Cranberry River about 100 m downstream of the outlet of Watercourse 1.

- Within the eastern portion of the property the surface water runoff enters watercourses or accumulates within beaver ponds (SWB). Surface water ultimately flows in a northwesterly direction along a watercourse (SW2) that discharges into Cranberry River upstream of the proposed extraction areas. This watercourse is designated as Watercourse 2.

Minor tributaries of Cranberry River also direct surface water from the northwestern portion of Sebright Quarry to Cranberry River. The catchment area for these watercourses is about 21.32 ha.

Cranberry River is monitored at one upstream station (SW1) and one downstream station (SW3) relative to the proposed extraction areas.

2.2 Natural Environment

The key findings of RiverStone's (2011) Natural Environment Report are as follows:

- The three main watercourses (Watercourses 1 and 2 and the Cranberry River) and the southern Monck Road drainage features can be protected by implementing the recommended mitigation measures. Maintaining the quality and quantity of water within the watercourses throughout the life of the quarry can be ensured by following the monitoring protocols provided in the Performance Monitoring Plan.

- The fish habitat identified on the subject property corresponds to a forage fish community in the smaller watercourses (1 and 2) and open-water portions of the online wetlands, and a warmwater fishery in the Cranberry River. Fish and fish habitat will not be affected by the proposed development provided the recommendations contained in this report are implemented (i.e. maintenance of riparian buffers, blast monitoring, control of water quality and quantity, and compliance with the federal and provincial legislation relating to fish and fish habitat).

- A considerable portion of the subject property either functions, or has the potential to function, as habitat for Endangered and Threatened species. Consequently, extensive studies were conducted to determine how the proposed quarry could be developed in a manner that would ensure the continued use of the subject property by the identified species. These studies have resulted in substantial changes to the proposed quarry. In addition to ensuring the resident

populations of Endangered and Threatened species remain viable, measures to achieve an "overall benefit" for affected species have been proposed as part of a permit application under the provincial Endangered Species Act.

- With regard to those species designated Special Concern (i.e. the third level within the Species at Risk group), detailed evaluations were also completed. Based on these evaluations, it is RiverStone's conclusion that as long as the recommendations made in this report are implemented, any impacts on these species and their habitat will be acceptable given the relevant legislation and policy requirements.

- Although the subject property is directly adjacent to Queen Elizabeth II Wildlands Provincial Park, the area proposed for licensing (the Site) is approximately 400 m away from the nearest extent of the park; furthermore, the nearest proposed extraction area is a minimum of 470 m away from the park. Finally, the area between the Site and the park has been identified as Endangered and Threatened species habitat in this report; these lands are therefore subject to numerous protective measures detailed herein and within the permit application being negotiated under the provincial Endangered Species Act. Consequently, it is not anticipated that there will be any negative impacts on the ecological integrity of the park; rather this quarry proposal would ensure the maintenance of a substantial buffer (with high ecological function) adjacent to the park in this location.

- As detailed and mapped in the Natural Environment Report, a wetland system with high natural heritage value and ecological function occurs on the subject property. None of the wetlands have been evaluated using the Ontario Wetland Evaluation System; therefore, they have not been designated Provincially Significant (i.e. a PSW). Despite this lack of formal evaluation, the natural heritage features within this wetland system, as documented by RiverStone, indicate that the wetlands within the subject property and adjoining lands would be designated provincially significant if evaluated. Accordingly, RiverStone has evaluated potential impacts on the wetland system, and has made recommendations to ensure its protection following the policy requirements that would be in effect if the wetlands were formally designated provincially significant.

- No other ecological communities recognized as being provincially or locally rare were identified on the subject property or adjoining lands.

- The final rehabilitation plan for the quarry will provide open water habitat for waterfowl. The rehabilitation plan has also been developed to include some areas of shallow habitat for aquatic, semi-aquatic, and terrestrial species via slopes and ledges. The final plan will also preserve the surface water drainage patterns to Watercourses 1 and 2 through the careful placement of lake outlets.

- Based on the findings presented in the Natural Environment Report, including the review of relevant environmental policy and legislation at federal, provincial, and municipal levels, RiverStone is of the opinion that the proposed quarry development plan will conform to these policies and provisions provided the recommendations contained herein are implemented. The required Official Plan and Zoning Amendments will allow for the proposed land use, while still preserving the Significant Natural Heritage Features identified on the subject property.

2.3 Quarry Development Concept

A quarry development concept is provided in Figure 3.

Phase I

Overburden will be stripped, where present, and stockpiled within the area to be extracted for use in future progressive rehabilitation. Rock will be removed from the rock knob located within the eastern portion of Sebright Quarry. Extraction will commence within the southern portion of Phase 1 and progress in a northerly direction. The initial excavation of Phase 1 (identified as Phase 1A) will be completed to an elevation higher than 242 m asl, such that the base elevation of the excavation will be above the surrounding ground surface and about 2 m above the water table of the surrounding low-lying area. Runoff within the excavation will flow toward the interior of the licensed area to the west.

Within the southern portion of Phase 1, an initial sump(s) will be excavated to an elevation of about 232 m asl to provide initial water storage for use as part of on-site operations, then for dewatering purposes as the base of the excavation of Phase 1 is deepened. Phase 1B will consist of the progressive deepening of the Phase 1A excavation to an elevation of about 220 m asl, with a base slope that directs runoff to the sump(s). The sump base elevation for Phase 1B would be about 215 m asl.

The on-site operations will initially include crushing and screening, with material transported off-site for washing. A Settling Pond and an Equalization Pond will be constructed and operated to reduce suspended solids within runoff and for eventual storage/recycling of wash water. Upon accumulation of sufficient water within the on-site sump(s), washing operations may be established. The plant and associated ponds will be located immediately west and south of Phase 2. This area is identified as the Stockpile and Processing Area on the Site Plan (Skelton Brumwell, 2011). Material stockpiles will be placed in the plant area or on the quarry floors during operation.

Phase 2

Phase 2 is located south of Phase 1 and will be started as Phase 1 nears completion. It may be necessary to commence portions of Phase 2 during extraction of Phase 1 to manage rock quality. Similar to Phase 1, Phase 2 may be operated in two phases. The base of Phase 2 will be about 220 m asl and extraction within Phase 2 will proceed in a north to south direction.

Settling and Equalization Pond

The Settling Pond and Equalization Pond will be located immediately southwest of Phase 2 to provide sufficient retention time for the water to remove suspended solids such that water may be reused for on-site processing of aggregate, and for discharge of water into the low-lying area southwest of the Stockpile and Processing Area.

The Settling Pond will be used as the primary settling pond for water that originates from runoff from the Stockpile and Processing Area or wash water from the washing plant. Water from the Settling Pond will be recycled for use as wash water or dust control.

The Equalization Pond will operate as a contingency secondary settling pond as it will collect excess discharge from the Settling Pond after excessive precipitation events and it will permit equalization of

water temperature from the dewatering systems for the extraction areas prior to discharge into the low-lying area of Watercourse 1. One downstream outlet from the Equalization Pond will discharge into the eastern portion of the low-lying area.

Rehabilitation

Quarry rehabilitation will include the establishment of a lake within the excavation. The final lake level will correspond with the lowest existing outlet elevation, although alternative outlets can be constructed at a similar or lower elevation. The outlets of the Phase 1/2 lake would be about 240 m asl.

Water Management Program

To maintain the surface water conditions within Cranberry River to pre-extraction conditions and to retain the ecological function of the central low-lying area and watercourses in the vicinity of the extraction areas, a water management plan will be implemented.

Runoff within the extraction area (Phases 1 and 2) will be managed through quarry dewatering. Runoff from the Stockpile and Processing Area will be contained by shallow ditches and directed to a Settling Pond. This runoff will continue to contribute to Watercourse 1, similar to pre-extraction conditions, and acceptable water quality will be maintained through the use of the Settling Pond and the Equalization Pond.

Dewatering of the extraction areas will be required to maintain suitable (dry) working conditions within the quarry. The amount of dewatering required will depend on the extraction area and depth, season, weather conditions, and operational requirements.

One objective of managing water removed from the extraction area is to maintain surface water flow in Watercourses 1 and 2. During dewatering of Phase 1 or Phase 1/2 the total surface water flow in Watercourse 1 will be similar to pre-extraction conditions or increase slightly during high flow conditions at the time of the spring freshet. Once Phase 1/2 has been extracted, pumping may need to be continued at a lesser rate to maintain seasonal surface water within the central low-lying area and Watercourse 1, and to allow for water accumulation within the excavation. The total surface water flow within Watercourse 2 will be similar or increase slightly during the spring freshet, which reflects the observed pre-extraction conditions. Water quality within Watercourse 1 and Watercourse 2 will be maintained by the discharge of water through the Equalization Pond and to the headwaters of Watercourse 2 near the southeastern portion of Phase 2, respectively. Upon rehabilitation of Phase 1/2, lake water will discharge directly into the low-lying area that drains to Watercourse 1 through a western outlet and to Watercourse 2 through a second outlet near the northeastern corner of the lake.

Water monitoring protocols, particularly those that pertain to the Central Marsh (W6), should remain adaptable to additional monitoring needs that may arise from requirements in a 17(2)(c) Permit under the *Endangered Species Act, 2007*.

3. Hydrogeology

The PMP for hydrogeology is summarized in Table 1 and detailed in the following sections. Monitoring has been initiated to provide input to establishing baseline conditions and will continue during quarry operations, and for two years upon achieving stable levels within the rehabilitated lake (excluding discharge monitoring). After two years, if no trigger mechanisms are exceeded, the monitoring program may be stopped.

3.1 Groundwater

Groundwater levels will be monitored bimonthly (every two months) prior to extraction, then monthly for shallow and deep monitoring wells at locations on the property and around the property perimeter, including BH03-1, BH03-4, BH03-5, BH03-6, BH04-7, and BH04-8.

Similar monitoring wells will be purged and sampled on an annual basis in May of each year. Parameters for analysis include field testing for pH, conductivity, and temperature, as well as laboratory testing for major ions, metals, total suspended solids, and nutrients.

In addition, annual groundwater levels will be obtained during May of each year at residential water wells located within 1 km of the property, where permission is provided.

3.2 Surface Water

Flow rates will be measured on a bimonthly frequency at stations SW1, SW2, SW3, SW4, SW5, SWA, and SWB. Upon activation of dewatering, monthly flow rate measurements will be completed during the dewatering period. Field parameters will be measured on a bimonthly frequency during dewatering and will include: pH, conductivity, temperature, turbidity, dissolved oxygen, and visible sheen.

When possible, surface water monitoring will be completed after precipitation events such that maximum potential runoff effects would be detected.

On a semi-annual basis in May (spring) and September (fall) the surface water stations will be sampled for a larger group of laboratory parameters. Once dewatering is initiated, the May sampling will correspond with a period of active dewatering. The parameters will include: major ions, metals, total suspended solids, nutrients, oil and grease, and BTEX parameters (benzene, toluene, ethylbenzene, and xylenes).

3.3 Quarry Discharge

Quarry discharge flow rates for dewatering pumps will be monitored automatically on a daily basis. Discharge quality from the dewatering pump(s) and the Equalization Pond will be sampled monthly for field parameters including pH, conductivity, temperature, turbidity, dissolved oxygen and visible sheen. A larger group of laboratory parameters will be analysed annually prior to dewatering of each phase and bimonthly from the dewatering pump(s) during dewatering. Sampling dates and parameters will be similar to those for surface water as noted in Section 3.2

3.4 Trigger Mechanisms

The Trigger Mechanisms presented in Table 2 will be used to determine if mitigation measures are required as outlined in Section 3.5. In instances where background concentrations naturally exceeded the ODWQS or PWQO, a trigger value of 75% of the background concentration is used.

3.5 Contingency Measures

The following contingency measures are provided for consideration in the event that the Trigger Mechanisms noted in Section 3.4 are exceeded.

For off-site groundwater effects, the construction of enhanced infiltration features along the south-central site boundary and associated drainage divide is suggested to reduce off-site impacts to the south.

- Construction of a groundwater recharge zone will maintain acceptable groundwater levels to the south. This recharge zone could be developed with an infiltration trench(s) or ponds that are supplemented with water removed from the quarry during dewatering.

- Construction of a low permeable barrier with grout-filled trenches or boreholes will prevent groundwater movement through rock fractures. As a result, groundwater drawdown would not extend beyond the property boundary and baseline groundwater conditions would be maintained to the south.

- A temporary potable water supply could be provided. The water supply wells impacted by the quarry would then be deepened or replaced with suitable groundwater supplies as a long-term contingency measure.

Surface water quality or quantity effects could be mitigated with the following.

- Quality could be improved with the discharge of water into a constructed wetland. Controlled flow through the wetland would reduce total suspended solids and provide additional water quality polishing and temperature equalization prior to discharge into a watercourse(s).

- The design of the Settling Pond could be improved to reduce the discharge rate, provide a longer residence time for enhanced settling, or provide additional storage capacity. In addition, supplemental inline settling ponds could be constructed owing to the large size of the Equalization Pond.

- Discharge may be directed to one or more discharge points to compensate for loss of surface water flow or to supplement surface water flow. As the tributaries of Cranberry River are ephemeral, they provide the opportunity for flow modifications in response to changing site operations or weather conditions. The overall flow into Cranberry River would remain the same.

3.6 Reporting

An annual report will be prepared to document the following.

- Historic data and data collected for the current year.
- An assessment of changes in data trends or patterns and an evaluation of potential quarry effects.
- A comparison of the data with the Trigger Mechanisms.
- A comparison of quarry dewatering rates to permitted rates in accordance with the Permit to Take Water.
- A summary of mitigative or contingency measures implemented and associated results.
- A summary of complaints and the response/action to resolve the complaints.
- Changes to the site operations.
- Recommended changes to the Performance Monitoring Program.

4. Natural Environment

The PMP for water quality and quantity with respect to the natural environment is summarized in Table 1. Monitoring has been initiated to provide input to establishing baseline conditions and will continue until completion of extraction/dewatering in Phase 4.

4.1 Surface Water and Discharge

The surface water and discharge monitoring program will be completed as presented in Section 3.1.

4.2 Terrestrial Vegetation and Wetlands

A semi-annual inspection during April/May and September/October will be completed to assess the condition of the Site's buffers. The inspection will include an evaluation of the sedimentation and erosion controls. An annual photographic record will be maintained to document the condition of the buffer areas commencing one year prior to the onset of quarry extraction operations.

4.3 Trigger Mechanisms

The Trigger Mechanisms for surface water quality and quantity, and discharge quality are detailed in Table 2. Sedimentation within the buffer areas as a result of quarry operations will initiate the contingency measures.

4.4 Contingencies

Contingency systems for surface water are presented in Section 3.5. For terrestrial vegetation and wetlands, the contingency measures for the 30 m buffer zones include the following.

- Placement of sedimentation control, such as fabric/geotextile or straw bales, on the quarry side of the affected buffer.

- Re-establish and/or expand the vegetation buffer upon completion of adjacent quarry activities.

4.5 Reporting

An annual report will be prepared to document the following.

- Historic data and data collected for the current year, including water quality and quantity, and terrestrial health.
- An assessment of changes in data trends or patterns, and an evaluation of potential quarry effects.
- A comparison of the data with the Trigger Mechanisms.
- A summary of mitigative or contingency measures implemented.
- Changes to site operations.
- Recommended changes to the Performance Monitoring Program.

5. Blasting

The blasting PMP will be implemented upon the commencement of blasting operations and will be maintained for the duration of blasting activities.

Monitoring recommendations presented in the Blast Impact Analysis Report (Explotech Engineering Ltd., 2011) are presented below and in the following subsections.

- An attenuation study shall be undertaken by an independent blasting consultant during the first 12 months of operation in order to obtain sufficient quarry data for the development of site specific attenuation relations. This study will be used to confirm the applicability of the initial guideline parameters and assist in developing future blast designs.

- All blasts shall be monitored for both vibration and overpressure at the closest privately owned sensitive receptors adjacent the property with a minimum of one (1) digital seismograph. Monitoring practices shall conform to industry standards.

- Blast design must be such that during the warm water spawning season (April – June 30) overpressure does not exceed 100 kPa (14.5 psi) or vibration exceed 13 mm/second at the edge to the closest open water.

- Blasting monitoring protocols should remain adaptable to additional monitoring needs that may arise from requirements in a 17(2)(c) Permit under the *Endangered Species Act, 2007*.

- Orientation of the aggregate extraction operation will be designed and maintained so that the direction of the overpressure propagation and flyrock from the face will be away from structures as much as possible.

- Blast designs will be continually reviewed with respect to fragmentation, ground vibration and overpressure. Blast designs shall be modified as required to ensure compliance with applicable

guidelines and regulations. Decking, reduced hole diameters and sequential blasting techniques will be used to ensure minimal explosives per delay period initiated.

- Minimum collar will be 1.5 m on body holes and 2.7 m on face holes. In the event of the application of boreholes greater than 100 mm in diameter, collars will be increased accordingly.

- Clear crushed stone will be used for stemming.

- Primary and secondary dust collectors will be employed on the rock drills to keep the level of rock dust to a minimum.

- Blasting procedures such as drilling and loading will be reviewed on a yearly basis and modified as required to ensure compliance with industry standards.

- Detailed blast records will be maintained.

5.1 Monitoring Locations

One (1) digital seismograph will be established at the closest privately owned sensitive receptor adjacent to the property to monitor and record ground vibration and overpressure levels.

Blasting monitoring protocols should remain adaptable to additional monitoring needs that may arise from requirements in a 17(2)(c) Permit under the *Endangered Species Act, 2007*. For example, an additional seismograph may have to be installed or locations modified to evaluate potential effects of blasting.

5.2 Trigger Mechanisms

The Trigger Mechanisms for blast monitoring at the closest privately owned sensitive receptor are as follows.

Vibration: 12.5 mm/second Peak Particle Velocity
Overpressure: 128 dB Peak Sound Pressure Level

The Trigger Mechanisms for blast monitoring during the warm spawning season (April 1 to June 30) must be that overpressure does not exceed 100 kPa (14.5 psi) or vibration exceed 13 mm/second at the edge of the closest open water. Blasting monitoring protocols should remain adaptable to additional monitoring needs that may arise from requirements in a 17(2)(c) Permit under the *Endangered Species Act, 2007*.

5.3 Contingencies

In the event of an exceedance of a Trigger Mechanism, one or more of the following contingencies will be implemented.

- Reduction in the explosives used per period or blast.
- Modification of the blasting schedule.
- Modify the orientation of the blast face.

- Modify the blasting design, including decking, reduced hole diameter, and sequential blasting techniques.

5.4 Reporting

An annual report will be prepared to document the following.

- Location, date and time of the blasts.
- Dimensional sketch including photographs, if necessary, of the location of the blasting operation, and the nearest point of reception.
- Physical and topographical description of the ground between the source and the receptor location.
- Type of material being blasted.
- Sub-soil conditions, if known.
- Prevailing meteorological conditions including wind speed in m/s, wind direction, air temperature in °C, relative humidity, degree of cloud cover and ground moisture content.
- Number of drill holes.
- Pattern and pitch of drill holes.
- Size of holes.
- Depth of drilling.
- Depth of collar (or stemming).
- Depth of toe-load.
- Weight of charge per delay.
- Number and time of delays.
- The result and calculated value of Peak Pressure Level in dB and Peak Particle Velocity in mm/s.
- Applicable limits or Trigger Mechanisms.
- A comparison of the data with the Trigger Mechanisms.
- A summary of public complaints and responses.
- A summary of mitigative or contingency measures implemented.
- Changes to site operations.
- Recommended changes to the Performance Monitoring Program.

Tables

TABLE 1
PERFORMANCE MONITORING PLAN
SEBRIGHT QUARRY

PARAMETER	FREQUENCY	LOCATIONS	PARAMETERS
Groundwater Levels	Bimonthly Prior to Extraction, Then Monthly	BH03-1, BH03-4, BH03-5, BH03-6, BH04-7, BH04-8	Water Levels
	Annually (May)	Residential Wells Within 1 km of Property	Water Levels
Groundwater Quality	Annually (May)	BH03-1, BH03-4, BH03-5, BH03-6, BH04-7, BH04-8	Field: pH, conductivity, temperature Lab: Major ions, metals, TSS, nutrients
Surface Water Flow Rates	Bimonthly, Monthly During Dewatering	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Flow Rate
Surface Water Quality	Semi-Annually (May and September)	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Field: pH, conductivity, temperature, turbidity, dissolved oxygen Lab: Major ions, metals, TSS, nutrients, oil and grease, and BTEX
	Bimonthly During Dewatering (After Precipitation Events when Possible)	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Field: pH, conductivity, temperature, turbidity, dissolved oxygen, visible sheen
Quarry Discharge	Daily	Discharge Point(s) For Dewatering Pump(s)	Flow Rates
	Monthly	Discharge Point(s) For Dewatering Pump(s) and Equalization Pond	Field: pH, conductivity, temperature, turbidity, dissolved oxygen, visible sheen
	Annually Prior to Dewatering of Each Phase and Bimonthly During Dewatering	Discharge Point(s) For Dewatering Pump(s)	Field: pH, conductivity, temperature, turbidity, dissolved oxygen, visible sheen. Lab: Major ions, metals, TSS, nutrients

NOTES:

1) Major ions include: chloride, sulphate, alkalinity, sodium, potassium, calcium, magnesium.
2) Metals include: Al, Sb, As, Be, Bo, Cd, Cr, Co, Cu, Fe, Pb, Mo, Ni, Se, Ag, Ti, V, Zn.
3) Nutrients include: total ammonia, nitrate, nitrite, and total phosphorus.
4) TSS indicates total suspended solids.
5) BTEX indicates benzene, toluene, ethylbenzene, and xylenes.
6) Bimonthly indicates once every two months. Semi-annually indicates twice per year.

TABLE 2
TRIGGER MECHANISMS
SEBRIGHT QUARRY

PARAMETER	TRIGGER MECHANISM	LOCATIONS	ACTION
Groundwater Levels	At BH03-1, BH03-4, BH03-6, BH04-7, and BH04-8: Groundwater level decrease by more than 1 m below baseline condition. At BH03-5: Groundwater level decrease of 5 m below baseline conditions.	BH03-1, BH03-4, BH03-5, BH03-6, BH04-7, BH04-8	Determine if the water level decrease is a result of quarry activities. If the impact is quarry related at BH03-1, BH03-4, BH03-6, BH04-7, and BH04-8 implement the applicable contingency measure. If the impact is at BH03-5, evaluate off-site residential well effects then: 1) implement contingency measures if required, or 2) revise Trigger Mechanism.
	Water level below pump intake or insufficient storage capacity in well to meet residential requirements.	Residential Water Wells	Determine if the water level decrease is a result of quarry activities. If the impact is quarry related, implement the applicable contingency measure.
Groundwater Quality	Degradation of water quality in excess of baseline conditions and ODWQS. Ammonia (Total): 50 mg/L Nitrate: 10.0 mg/L Phosphorus: 0.2 mg/L	BH03-1, BH03-4, BH03-5, BH03-6, BH04-7, BH04-8	Determine if the water level decrease is a result of quarry activities. If the impact is quarry related, implement the applicable contingency measure.
Surface Water Flow Rates	Decrease or increase in flow rate more than 50% of baseline flow rate.	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Determine if the flow rate change is a result of quarry activities. If the impact is quarry related, implement the applicable contingency measure.
Surface Water Quality	Degradation of water quality in excess of baseline conditions (*) and PWQO. TSS: 25 mg/L Ammonia (unionized): 0.02 mg/L Total Phosphorus: 0.2 mg/L* Oil & Grease: 1.0 mg/L Antimony: 0.020 mg/L Arsenic: 0.005 mg/L Boron: 0.200 mg/L Cadmium: 0.0001 mg/L Chromium: 0.0089 mg/L Cobalt: 0.001 mg/L* Copper: 0.002 mg/L* Iron: 2.2 mg/L* Lead: 0.001 mg/L Molybdenum: 0.040 mg/L Nickel: 0.025 mg/L Silver: 0.0002 mg/L* Vanadium: 0.006 mg/L Benzene: 0.100 mg/L Toluene: 0.0008 mg/L Ethylbenzene: 0.008 mg/L Xylenes: 0.002 mg/L	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Determine if the water quality change is a result of quarry activities. If the impact is quarry related, implement the applicable contingency measure for quarry discharge.

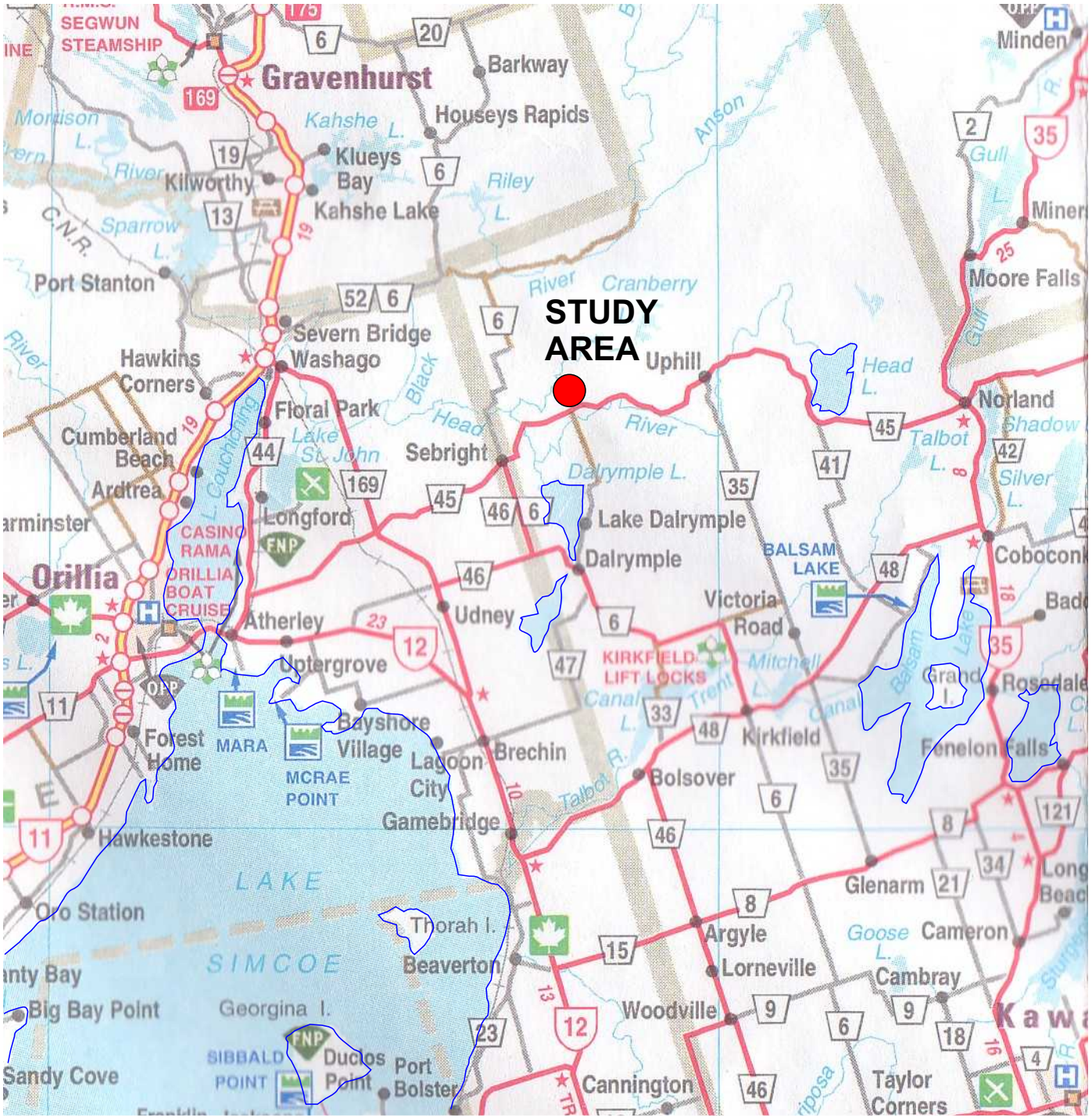
TABLE 2
TRIGGER MECHANISMS
SEBRIGHT QUARRY

PARAMETER	TRIGGER MECHANISM	LOCATIONS	ACTION
	Turbidity: 100 NTU	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Test for TSS. If TSS is >25 mg/L and the change is quarry related, implement the applicable contingency measure.
	Visible Sheen	SW1, SW2, SW3, SW4, SW5, SWA, SWB	Determine if the water quality change is a result of quarry activities. If the impact is quarry related, implement the applicable contingency measure for quarry discharge.
Quarry Discharge	Exceeds permitted flow rate	Discharge Point(s) for Dewatering Pumps	Reduce discharge rate in accordance with Permit.
	Turbidity: 100 NTU	Discharge Point(s) for Dewatering Pumps, Equalization Pond	Test for TSS. If TSS is >25 mg/L and the change is quarry related, implement the applicable contingency measure.
	TSS: 25 mg/L Ammonia (unionized): 0.02 mg/L Total Phosphorus: 0.03 mg/L Oil & Grease (Mineral/Synthetic) : 1.0 mg/L	Discharge Point(s) for Dewatering Pumps	Implement the applicable contingency measure.

NOTE:

1) '*' denotes concentration naturally exceeds PWQO.

Figures



LEGEND

APPROXIMATE LOCATION OF STUDY AREA

N
W E
S

MAP SOURCE:
2003 OFFICIAL ONTARIO ROAD MAP, MINISTRY OF TRANSPORTATION, 1:700000 SCALE.

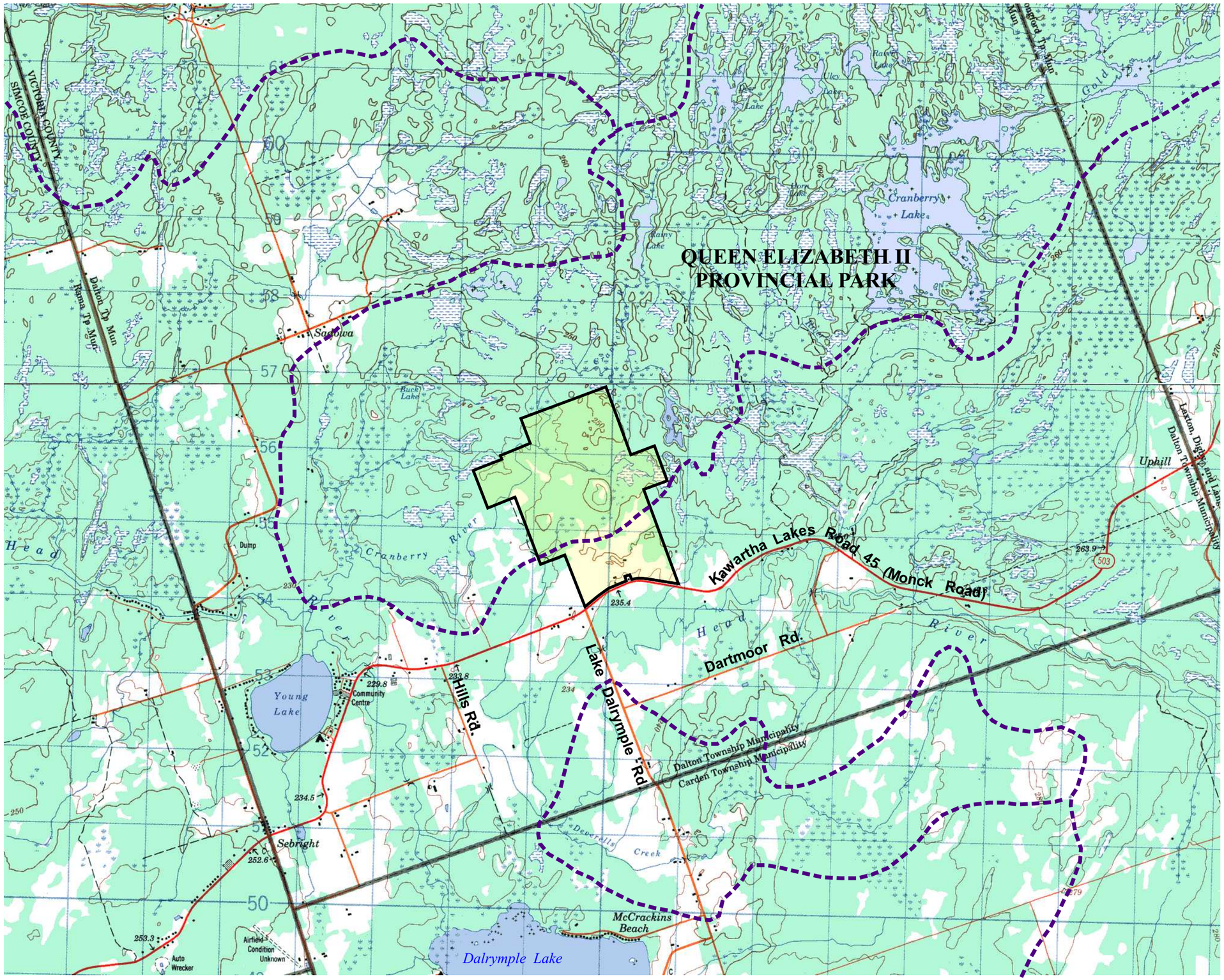
LOCATION MAP

PERFORMANCE MONITORING PLAN
SEBRIGHT QUARRY
For Giofam Investments Inc.

DATE: APRIL 2011	SCALE: 1:350000
PROJECT: 0-920365.05	REF. NO.: 0-92036505F1-LM

GENIVAR

FIGURE 1



LEGEND

PROPERTY BOUNDARY

ESTIMATED WATERSHED BOUNDARY
PER 1:50,000 NTS MAP

N

500 0 1000 m

NOTE:
NTS 1:50,000 MAP SOURCE: GRAVENHURST 31D/14 AND ORILLIA 31D/11.

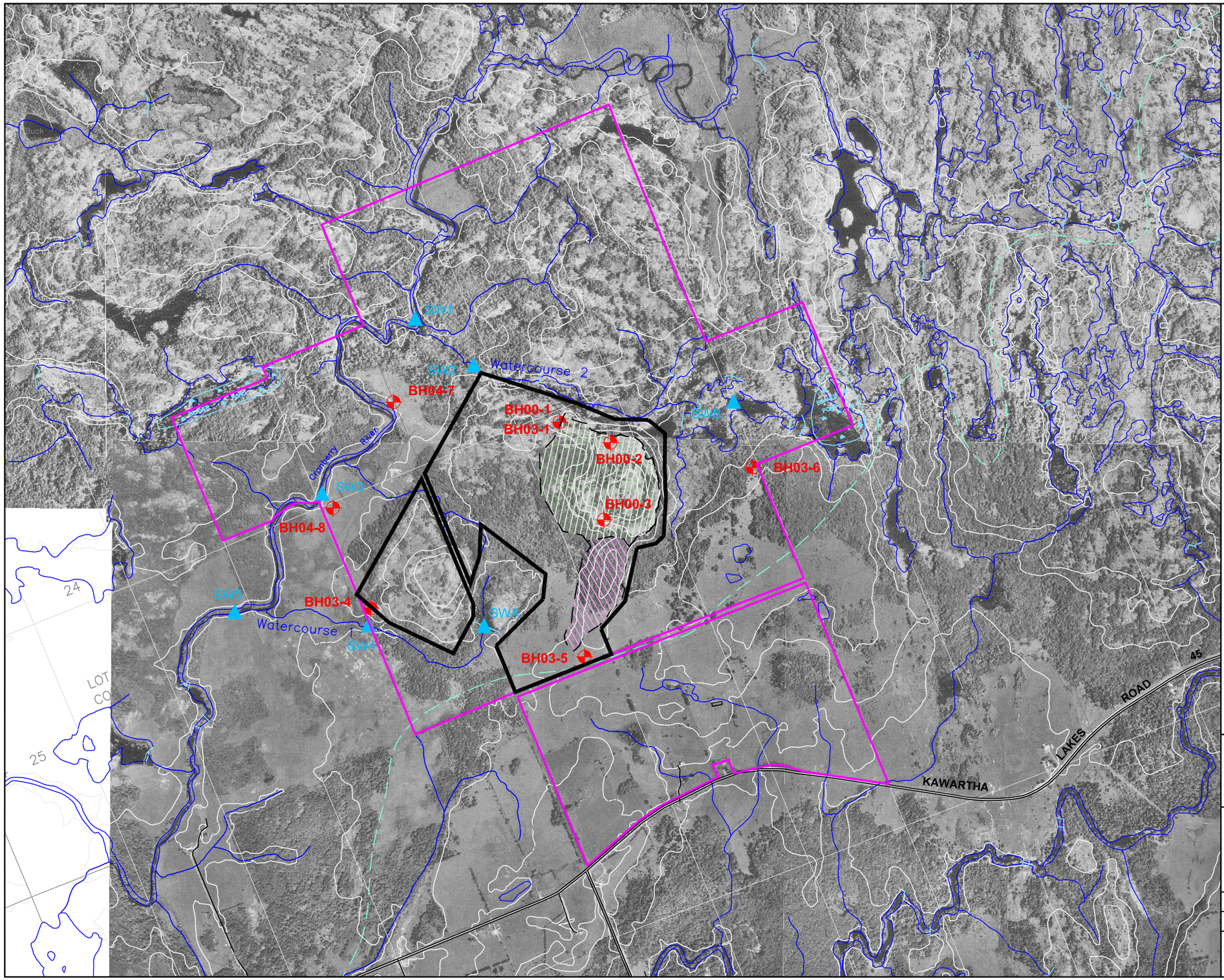
REGIONAL PLAN

PERFORMANCE MONITORING PLAN
SEBRIGHT QUARRY
For Giofam Investments Inc.

DATE: APRIL 2011	SCALE: 1:50000
PROJECT NO.: 0-920365.05	REFERENCE NO.: 0-92036505F2-LM

GENIVAR

FIGURE 2



LEGEND

- PROPERTY BOUNDARY
- ESTIMATED WATERSHED BOUNDARY
- BH03-5 — BOREHOLE AND/OR MONITORING WELL LOCATION AND DESIGNATION
- SW2 — SURFACE WATER MONITORING STATION AND DESIGNATION
- BOUNDARY OF AREA TO BE LICENSED
- - PHASE 1
- - PHASE 2

150 0 300 metres

NOTES:
1. AIR PHOTOGRAPHY SOURCE: a)87-443-, 09-142 TO 144, b) 87-4431, 07-122 TO 128.
2. BASE MAPPING FROM OBM 1:10000 SHEETS 101764504950, 101764504955, 101765004950 AND 101765004955, NAD 27 DATUM.
3. CONTOUR INTERVAL IS 5 m.

PROPERTY DEVELOPMENT CONCEPT

PERFORMANCE MONITORING PLAN
SEBRIGHT QUARRY
For Giofam Investments Inc.

DATE: APRIL 2011	SCALE: 1:15000
PROJECT: 0-920365.05	FILE NO.: 0-92036505F3-SP
GENIVAR	FIGURE 3