

# ENGINEERING AND TECHNICAL SERVICES ADVISORY COMMITTEE (ETS)

## AGENDA

Meeting: Friday, June 11, 2010

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### Committee Members

Ralph Hough	Township of Oro-Medonte
John McKean	Town of The Blue Mountains
Chris Carrier	Town of Collingwood
Mary Brett	Township of Adjala-Tosorontio
Cal Patterson	Town of Wasaga Beach
Gerald Poisson	City of Barrie
Joan Sutherland	Town of New Tecumseth
Robert Walker	Township of Clearview

### Staff Members

Glenn Switzer	Director of Engineering and Technical Services
Ryan Post	Hydrogeologist/Source Water Protection Coordinator
David Featherstone	Manager, Watershed Monitoring Program

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### ITEMS FOR DISCUSSION

1. Adoption of Agenda.
2. Groundwater Management Plan (see attached report)

### Recommendation

**WHEREAS** that the Nottawasaga Valley Watershed Management Plan (1994) and the Strategic Update (2006) recognizes the importance of effective groundwater management on a watershed scale.

**BE IT RESOLVED** that the Engineering and Technical Services Advisory Committee receive the NVCA Groundwater Management Plan

**AND FURTHER** that the NVCA Groundwater Management Plan be forwarded to the next Full Authority meeting for discussion and adoption.

3. Other Business.
4. Adjournment.



## STAFF REPORT

**Date:** June 11, 2010

**To:** The Chair and Members of the Engineering and Technical Services Advisory Committee

**From:** Ryan Post, Hydrogeologist-Source Protection Coordinator

**Subject:** NVCA Groundwater Management Plan

### Recommendation

**WHEREAS** that the Nottawasaga Valley Watershed Management Plan (1994) and the Strategic Update (2006) recognizes the importance of effective groundwater management on a watershed scale.

**BE IT RESOLVED** that the Engineering and Technical Services Advisory Committee receive the NVCA Groundwater Management Plan

**AND FURTHER** that the NVCA Groundwater Management Plan be forwarded to the next Full Authority meeting for discussion and adoption.

### Background

Groundwater is a valuable resource. Groundwater is essential for municipal water supply, private water supply, and irrigation in some highly productive agricultural areas. It maintains wetlands and river flow during dry spells and is vital to the maintenance of their rich ecology and biodiversity. Groundwater is an invaluable resource which must be managed in a sustainable way to maintain and enhance its contribution to social, economic and environmental welfare.

Direction for resource management in the Nottawasaga Valley Watershed is driven by the Nottawasaga Valley Watershed Management Plan (1994) and the Strategic Update (2006). These documents provide direction for resource management in the Nottawasaga Valley watershed and attempts to coordinate existing provincial legislation and policy into a useful background document which: supports and addresses a wide variety of land use issues; identifies key responsibilities of stakeholders; and makes recommendations for the implementation of resource management actions.

Regarding Groundwater Management, the NVCA Watershed Plan Strategic Update (2006) states:

*“The NVCA believes that integrated watershed management should include the development of a Groundwater Management Program to manage and protect the groundwater resources within the watershed or ground watershed. Groundwater is vital to the livelihoods and health of the majority of watershed residents. It provides much of the water resource for domestic, agricultural, industrial use and ecological uses.”* (Section 3.0 Watershed Issues Both Old and New, page 14)

In support of this, the NVCA Board of Directors endorsed groundwater target states:

*100 % of the NVCA groundwater aquifers shall meet the following criteria: provincial water quality standards/objectives are met, long term average annual aquifer water levels are sustained and base flows to watercourses are sufficient to provide a healthy aquatic ecosystem.*

### **NVCA Groundwater Management Plan**

Building on the direction provided in the Nottawasaga Valley Watershed Management Plan, staff have prepared a Groundwater Management Plan that forms the business foundation for the NVCA’s involvement in groundwater resource management. The plan utilizes and builds on the information produced in municipal groundwater studies that were completed by the municipalities and source water protection initiatives. The purpose of the NVCA Groundwater Management Plan is:

1. Provide an overall comprehensive understanding of the hydrogeology of the NVCA watershed
2. Provide direction as to how best to protect the NVCA watershed groundwater resources
3. Identify constraints as well as opportunities for future development from a hydrogeological perspective
4. Serve as a basis for determining what future steps should be taken by the NVCA regarding groundwater management.

The Plan outlines groundwater-related legislation in Ontario, geological and hydrogeological setting of the NVCA watershed including groundwater quality of the aquifers and existing groundwater demands. The key program areas of the NVCA Groundwater Management Plan include:

1. Monitoring
2. Data/ information management
3. Public outreach, education, and communications
4. Groundwater stewardship
5. Technical plan review
6. Source Water Protection
7. Special Projects

**Benefits to the member municipalities**

The Groundwater Management Plan serves as a foundation to support the NVCA groundwater target. It outlines in detail the program areas and services that the NVCA can provide to our member municipalities and identified partners in support of groundwater as well as identifying constraints as well as opportunities for future development from a hydrogeological perspective.

Submitted by:

Reviewed by:

Approved by:

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Ryan Post  
Hydrogeologist, Source  
Protection Coordinator

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Glenn Switzer  
Director of Engineering  
and Technical Services

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Wayne Wilson  
CAO\Secretary Treasurer

## **Background:**

### **10.0 NVCA Groundwater Management Strategies**

#### **10.1 Introduction**

In keeping with the NVCA mission statement of “Conserving our Healthy Waters”, the overarching goal of the proposed NVCA Groundwater Management Program is to develop and implement a proactive, long-term groundwater resources management program in partnership with the appropriate provincial ministries and local municipalities with input from the stakeholder community and general public. This can be achieved by effectively addressing the interests of stakeholders and the community to protect the health and viability of the groundwater as a sustainable resource for both current users and future generations.

The purpose of the proposed NVCA Groundwater Management Program is to provide a clear direction on the sustainable management of the groundwater resources for the residents of the NVCA watershed. The primary focus of the NVCA Groundwater Management Plan is to satisfy the NVCA groundwater target which states:

*100 % of the NVCA groundwater aquifers shall meet the following criteria: provincial water quality standards/objectives are met, long term average annual aquifer water levels are sustained and base flows to watercourses are sufficient to provide a health aquatic ecosystem.*

#### **10.2 Proposed NVCA Groundwater Management Program**

Recommended groundwater action plans were produced in the municipal groundwater studies for the NVCA including the SSGWS (Golder Associates, 2004), the AEMOT Groundwater Management Study (Greenland, 2001), and the Dufferin Municipal Groundwater studies (Mulmur, Shelburne, Mono, and Amaranth, RJ Burnside, 2001). In recognition of this and through this desk top exercise, NVCA staff propose a NVCA Groundwater Management Program for the NVCA watershed that utilizes and builds on the information produced in these various municipal groundwater studies. The key components of the NVCA Groundwater Management Program include:

1. Monitoring
2. Data/ information management
3. Public outreach, education, and communications
4. Groundwater stewardship
5. Technical support for NVCA programs (plan review and regulations)
6. Source Water Protection
7. Special Projects

Each section is expanded upon below.

##### **10.2.1 Monitoring**

Groundwater monitoring is the systematic collection and evaluation of data which enables the long-term understanding of groundwater conditions. The NVCA groundwater monitoring is focused on two main areas: streamflow monitoring related to baseflow (groundwater contributions to water courses) and aquifer monitoring. The data generated from monitoring will be used by our partner municipalities, MOE, DFO, and other water-related agencies in support of their mandates. It will also support of NVCA policy development and will be used in the public outreach, education and communications component of this program (See section 10.3.3). The objectives and associated strategies of groundwater monitoring are:

- 1) Quantify regional aquifer water quality and quantity to determine long term trends and issues
  - Working with our member municipalities, develop in collaboration with the MOE and the County of Simcoe, an integrated groundwater monitoring network that incorporates the existing NVCA Provincial Groundwater Monitoring Network (PGMN), the County of Simcoe landfill monitoring wells, and the monitoring wells associated with the municipal supply system to better characterize NVCA groundwater resources.
  - Continue to work with the MOE PGMN program to install monitoring wells/well nests (or conversion of existing wells) with priority given to sensitive areas and areas of significant hydrogeologic uncertainty and in areas identified by the MOE to monitor the major aquifers in the NVCA.
  - Complete annual Provincial Groundwater Monitoring Program water quality sampling and other operational activities outlined in the MOE-CA PGMN agreement.

- Working with the MOE and municipal partners where required, enhance data collection methodology to support well-to-web information transfer initiatives for PGMN monitoring wells.
- 2) Quantify baseflow contributions to NVCA watercourses
- Baseflow monitoring will consist of annual baseflow measurement of representative water courses throughout the NVCA watershed to characterize groundwater-surface water relationships. Baseflow monitoring will be completed in parallel with the watershed health report card initiative and in support of the NVCA fisheries habitat plan.
  - Develop and pursue surface-groundwater interaction studies in areas of special interest. This will be completed in support of development and planning applications, i.e. the Niagara Escarpment area.
- 3) Enhance NVCA groundwater data with the annual compilation and review of all monitoring data and the integration of groundwater information with ongoing surface water and climate monitoring database.

### **10.2.2 Data/information management**

Groundwater data is comprised of multiple data sources including monitoring data (quantity and quality), geological data, water-related permits information, etc. The following initiatives are recommended to manage the data and make it readily accessible to our partner agencies and the public:

1. The NVCA will develop an environmental monitoring enterprise database that will allow for the incorporation of new information on surface water and groundwater, such as new wells, water quality, groundwater levels and stream flow data. This data management platform is targeted to be web-based and enhanced over time to allow for standard queries and tools for assisting with activities such as land use planning and rezoning requests, assessing PTTW applications, and other development activities that might impact on groundwater and/or surface water quantity or quality
2. Groundwater well data will be managed through population of SiteFX/ViewLog platforms.
3. The development of a 3D FeFLOW groundwater model coupled with the HSPF surface water model for the NVCA is being completed through Source Water Protection. This is a valuable watershed management tool to assist with a comprehensive understanding of the integrated surface water and groundwater resources of the NVCA. These computer programs will enable the NVCA to assist our partners in the ongoing management of groundwater resources and can be utilized in land use planning, PTTW applications, pond applications, major water extractions, impacts of aggregate extractions etc for the NVCA, municipalities.
  - The models will be updated/maintained to facilitate regular revision, where warranted, of key technical products; such as the WHPAs and ISI mapping, etc.,

### **10.2.3 Public outreach, education, and communications**

Outreach, education and communication are important tools that can be used in raising awareness of the value and importance of our groundwater resources. The public are generally unaware of the value of this hidden resource and its vulnerability from surface activities. The objectives of the NVCA GMP public outreach and communications component are:

1. Provide and enhance general groundwater education, including quality and quantity issues, to the general public within the NVCA watershed area in conjunction with municipal partners. Also, educate individuals potentially affected by new groundwater policies authored by the Province/NVCA.
  - Completed through the utilization of the NVCA website as a mechanism for communications and develop and distribute media releases to area media to build awareness and branding of the NVCA and NVCA groundwater program.
  - Working collaboratively with neighbouring conservation authorities and municipal partners to develop groundwater communication strategies focusing on groundwater issues.
  - Groundwater Report Cards.
  - Through the NVCA outdoor education program.

### **10.2.4 Groundwater Stewardship**

Financial incentives are based on two key areas: wells and septic systems. Wells are expensive and are generally an asset to the property even if they are not currently in use- as long as they are properly maintained. If it is decided that a well has no useful purpose, has no potential future use or has no real value, and may constitute a liability, then the well is abandoned and must be properly decommissioned. Wells that are improperly maintained or are unused and have been improperly decommissioned (abandoned), pose a serious risk to groundwater quality as a potential contaminant source pathway to the aquifer.

Similarly, a septic system treats sewage on-site and releases the treated effluent back into the groundwater. Failed or failing septic systems pose a significant threat to groundwater quality via nutrient and chemical loading to the groundwater system.

Building on existing stewardship programs, the objectives of the NVCA Groundwater Management stewardship program are:

1. Develop a sustainable, long-term program of financial incentives in collaboration with the Province, the counties of Simcoe, Dufferin, and Grey and the Simcoe-Muskoka and the Wellington-Dufferin-Guelph health units to assist private landowners to undertake measures to reduce the risks to groundwater, specifically focusing on decommissioning unused water wells, upgrade existing wells, and septic inspections. This is to be accomplished by:
  - Research existing well upgrade/decommissioning and septic inspection programs currently offered by other Conservation Authorities, (i.e. Rideau Valley and Central Lake Ontario conservation authorities) to identify roles and responsibilities of the various agencies, funding mechanisms, program uptake, and applicability to the NVCA.
  - Work collaboratively with municipalities and health units to develop a program which satisfies all involved agencies requirements while focusing on well and septic issues in primary target areas, i.e. well head protection areas, significant recharge areas, and highly vulnerable aquifers.

### **10.2.5 Technical support for NVCA programs (plan review and regulations)**

The Planning Act, the Provincial Policy Statement, and associated regulations, determine the planning process in Ontario. These documents along with the Conservation Authorities Act outline the environmental and resource management responsibilities for conservation authorities. Conservation authorities have become the primary local agency to review and comment on development proposals pursuant to the Planning Act related to the NVCA's mandate to manage the watershed's natural resources.

The NVCA Planning Services provides leadership and expertise in ecosystem management by promoting planning on a watershed basis. This is achieved through cooperation, integration, and partnerships with our municipalities and other clients to implement the vision, goal, objectives and targets of the Authority's Watershed Plan. As part of the Engineering and Technical Services, Professional Hydrogeological review is required where the groundwater resources can be potentially impacted, i.e. through Conservation Authorities Section 28 regulations. The objectives of the NVCA Groundwater Management Program technical support (plan review and regulations) include:

1. Provide technical review support for existing program areas, policies and legislation pertinent to the NVCA.
  - Develop tools to streamline plan review and NVCA hydrogeology/ geology submission requirements to improve stream health and meet Provincial Water Quality Objectives by reviewing hydro-geologic impacts of development proposals.
  - Provide technical support for Municipal Official Plan review
2. In collaboration with the NVCA municipalities, develop policies, guidelines, and standards to effectively manage groundwater resources in the NVCA watershed.
3. Develop guidelines in concert with NVCA engineering staff for pre-post water budget requirements for development applications and develop hydrogeological standards to support NVCA policies while working within the respective legislative limits and utilizing best available science and policy directions.

4. Assist with Watershed Plans with regards to groundwater/geology/hydrogeology.

### **10.2.6. Source Water Protection**

Drinking Water Source Protection is the first step in a multi-barrier approach to protecting our sources of drinking water before they become contaminated. Conventional water treatment removes many potential contaminants that can result in illness and even death; however preventing contamination is a much more effective way of ensuring clean drinking water and avoiding serious health issues. The ultimate goal of the SPC is to develop Source Protection Plans and implement strategies for safeguarding the watershed's surface and ground water sources from contamination and overuse. The planning process is compelled through a 4 stage process. The first major task for the SPC was to prepare a Terms of Reference which identified the details of tasks to be completed, including parties responsible for conducting the work, and estimates for time and budgets. Stage two involves the preparation of the Assessment Report due in 2010. Stage Three of the Source Protection process will be the development of the Source Protection Plan following approval of the Assessment Report by the MOE. The plan will build on information from the Assessment Report, setting out policies and risk management strategies to address any significant threats to the municipal drinking water supply. Stage Four is the final stage and involves executing the SPP. These municipalities will be substantially involved with the implementation of the SPP policies, as implementation may require amendments to Official Plans and revision to land-use zoning to abide by the goals expressed in the SPP.

The provincial government made a commitment to the citizens of Ontario by passing the Clean Water Act in 2006. Locally, the South Georgian Bay Lake Simcoe Source Protection Committee is working with partners, stakeholders and residents to establish a Source Protection Plan specific to our area.

To date, the objectives of the NVCA Groundwater Management Program SWP component are:

1. Provide technical, administrative, and communication support to the lead Source Protection Authority
2. Actively liaise with the NVCA member municipalities in the delivery of source water protection initiatives
3. Complete program/project deliverables as jointly determined by the lead Source Protection Authority.

Once the plan is completed in 2012, the Source Protection Authority will continue to have a role in monitoring and reporting on progress in implementing the source protection plan, and in amending the Source Protection Plan.

Duties that the SPA (NVSPA) will incur under the *Clean Water Act* following the plan completion includes:

- Annual progress reports (CWA, Section 46 (1))
- Monitoring (CWA 45)
- Enforcement (CWA 48 (1))

It is anticipated that the NVCA staff hydrogeologist will play an active role in the implementation of the Source Protection Plan. Working with our member municipalities, the NVCA will strategically align itself for enforcement.

### **10.2.7 Special Projects**

The focus of this program is to deliver special projects in representative areas of diverse hydrogeological and socio-economic setting to aid in the understanding of the quantitative and qualitative aspects of ground water potential. Information obtained from these programs will provide an improved scientific understanding of key critical groundwater aquifers. Staff will continually explore for funding opportunities to develop and deliver special projects. To date, NVCA staff have participated in:

<b>Project</b>	<b>date</b>	<b>Funding agent</b>	<b>partners</b>	<b>Project Lead</b>	<b>Total project cost (including in-kind support)</b>
Niagara Escarpment Baseflow study	2008, 2009	Niagara Escarpment Biosphere Reserve Fund	NEC, Trout Unlimited, NVCA	NVCA	\$10,500 per year

		Trout Unlimited			
Agricultural Water Use Assessment for the Innisfil Creek Subwatershed	2008	Agricultural Adaptation Council :  CANADA-ONTARIO WATER SUPPLY EXPANSION PROGRAM	Ministry of Natural Resources Simcoe County Federation of Agriculture OMAFRA Ontario Potato Board Sod Growers Ministry of the Environment Agriculture and Agri-Food Canada/Agriculture et Agroalimentaire Canada Town of Innisfil Town of New Tecumseth Woodington Lake Golf Club Green houses and Nursery Vegetable Industry	NVCA	\$ 92,225
An integrated water resource management strategy for the Innisfil Creek Subwatershed	2009	Agricultural Adaptation Council :  Agricultural Environmental Stewardship Initiative (AESI)	Ministry of Natural Resources Simcoe County Federation of Agriculture OMAFRA Ontario Potato Board Sod Growers Ministry of the Environment Agriculture and Agri-Food Canada/Agriculture et Agroalimentaire Canada Town of Innisfil Town of New Tecumseth Woodington Lake Golf Club Green houses and Nursery Vegetable Industry	NVCA	\$142,200
Innisfil Creek Low Flow Pilot Project	2008	MNR	MNR Water Response Team	NVCA	\$12,000
Dufferin Headwaters Pilot Study	2006-present	MOE	NVCA GRCA CTC (CVC, TRCA) MNR MMAH MOE Dufferin Municipalities Conservation Ontario	NVCA	\$85,000

Oro Moraine Geological investigation	2005-present	Ontario Geological Survey	OGS NVCA LSRCA SSEA Oro-Medonte Barrie, Essa, Springwater,	Ontario Geological Survey	\$750,000
Orangeville Moraine Geological investigation	2007-present	Ontario Geological Survey	OGS NVCA, GRCA, CVC Mono, Amaranth	Ontario Geological Survey	\$750,000
Barriers and Benefits of Nutrient Management, Innisfil Creek subwatershed	2009-present	OMAFRA (COA)	OMAFRA NVCA Ontario Soil and Crop Improvement Association Ontario Federation of Agriculture	NVCA	\$42,000
Desktop review of the Hydrogeology-Minesing Wetlands and Minesing groundwater Monitoring Program	2009	Nature Conservancy of Canada	NVCA Friends of Minesing NCC	NVCA	\$25,000

Staff are seeking municipal and partner input on additional projects. Potential future projects include:

- Subwatershed plan updates- groundwater component
- Laurentian Channel 3-D geological block model development
- Municipal isotope age dating project
- Nitrate analysis in shallow aquifers in areas of intense agricultural practices

### **10.3 Integration of Existing Programs and Projects**

Drinking Water Source Protection initiatives include delineation of four significant areas (significant recharge areas, highly vulnerable aquifers, well head protection areas, and intake protection zones) along with the identification of threats to the drinking water sources. Through a parallel water budget exercise, the geology and hydrostratigraphy of the NVCA is being revisited with a FeFLOW model to be developed on a watershed scale. Three main documents will be generated from Drinking Water Source Protection: a Terms of Reference in mid 2009, an Assessment Report in mid 2010, and finally the Drinking Water Source Protection Plan in fall of 2012. As a result, planning and policy framework is projected to be completed in 2012 with transitional policies developed beforehand. Potential policies/SWP program areas include:

- Develop policies that are included in the official plan for WHPA, significant recharge area, and vulnerable aquifer protection.
- Develop and fund an area wide monitoring program that would include allowance for the installation, sampling, and maintenance of groundwater and surface water stations and the compilation of monitoring data.
- Develop communication and outreach components for groundwater and source water protection initiatives.

The Drinking Water Source Protection is developing a good groundwater scientific background that will be utilized with the proposed NVCA Groundwater Management Program. The groundwater management program is dynamic and built using the best available science and will be enhanced and modified when new products area generated through various initiatives, including the data generated through Drinking Water Source Protection.

#### **10.4 Groundwater Management Project Partners**

Provision of sufficient water of good quality under growing water demands and increasing climate variability will be one of the main concerns for water managers in the coming decades. It is generally accepted that an integrated approach is required where resource development options and demand management go hand in hand to provide a management structure with balances between immediate demand from different user groups and the short- and long-term environmental functions of our water resources. Quite simply, partnership is a key to effective groundwater management.

The success of this GMP as discussed throughout this document will also benefit from a broader partnership in planning, developing, and managing of our water resources. It is fundamental that the NVCA GMP be implemented through a partnership model with the affected stakeholders. That means the ultimate plan will truly have the consensus of all parties who have a stake in groundwater. Potential partners include:

- Municipalities within the NVCA
- Ministry of the Environment
- Ministry of Natural Resources
- Ministry of Agriculture, Food, and Rural Affairs
- Ministry of Municipal Affairs and Housing
- Conservation Ontario
- Department of Fisheries and Ocean
- Permitted Water takers (Agri-business, industries, farm organizations, domestic well owners)
- Education agencies
- Public Health Units
- Members of the public and private well owners