

UPFRONT



The Right Mix

*Dan Mohr, P.Eng.
Senior Engineer/Branch Mgr.
Jagger Hims, St. Catharines*

At Jagger Hims, we hold firm to the conviction that we can best serve

our clients by having the right mix of multidisciplinary professional and technical staff. This diverse team drives our ability to respond to our clients' needs with superior service.

In this edition, we highlight a team that serves the source water protection needs of our clients across Ontario. We also highlight the development of a new conventional biological and bio-process services group within Jagger Hims.

Gary Hendy and Lloyd Lemon continue to build our Source Water Protection team. Encouraged and funded by the MOE, municipalities are moving towards better management of their water supplies. To date, several municipalities and conservation authorities, including Durham Region and Lake Simcoe Region Conservation Authority have retained Jagger Hims for projects such as groundwater vulnerability analysis, issues evaluations, threat assessments and ambient groundwater quality analysis.

Kenneth Jobity, biologist, joined us in early 2007 as a Senior Project Scientist tasked to establish a new conventional biological and bio-process services group. Kenneth brings a diverse background from both the private and public sectors.

Teaming with our environmental services and hydrogeology professionals, he is implementing our expertise in phytoremediation as a novel and practical tool to clean up organic contaminated sites and manage impacted water.

Jagger Hims continues to develop innovative teams of professionals that respond to the needs of our clients.

Source Water Protection TEAM

New Team Performs Water Quality Risk Assessment



*Lloyd Lemon
Jagger Hims* *Betty McIntosh
Hamilton Township* *Gary Hendy
Jagger Hims*

In late 2006, the Province of Ontario made funding available to municipalities and their conservation authority partners to conduct technical studies to continue work on programs to identify and assess risks to municipal water supplies.

Jagger Hims Limited assembled a team of qualified professionals to undertake studies in groundwater vulnerability analysis, issues evaluations, threats assessments, and Tier 1 Water

Quality Risk Assessments following the approach outlined in guidance provided by the Ministry of the Environment.

Under the leadership of Gary Hendy and Lloyd Lemon, this team was successful in obtaining several large projects across the province.

One of these, an initial drinking water study, was completed on behalf of Hamilton Township in 2006/2007. This work involved delineation of capture zones for the municipal wells in Camborne and Creighton Heights using a numerical groundwater flow model and field surveys to confirm potential land use activities that may pose a threat to these groundwater supplies.

According to Township of Hamilton's Betty McIntosh, Jagger Hims, having successfully passed through the bidding process,

continued on page 2

New Senior Scientist Expands Core Services Introducing Phytoremediation

Pop and Lock Corporation uncovered TCE contamination from previous tenants on its Welland site dating back over 30 years. Proposed interceptor trench or DNAPL source treatments proved to be expensive with significant site disruption involved. The site was in a residential area and odours were a real issue.

Jagger Hims Limited Senior Project Scientist Kenneth Jobity, proposed a novel in-situ technology using hybrid poplars to remediate the TCE and contain the groundwater with minimal site disruption. Pop and Lock CEO Brian Mitchell was impressed by this cost



*Richard G. Limoges, C.O.O.,
Pop and Lock Corporation* *Kenneth Jobity
Jagger Hims*

effective approach and retained Jagger Hims to proceed.

Phytoremediation, new in Ontario,

continued on page 2

WATER BUDGET ASSESSMENTS

There is an increasing demand for water budget assessments in support of various scales of proposed development, or to demonstrate the sustainability of a proposed water taking. These assessments can be required under provincial regulations or by local conservation authorities and municipalities as a component of development applications.

A water budget is a simple accounting method which demonstrates the balance between water inputs and outputs within a designated area of interest. Water budgets can be prepared on any scale from a watershed to an individual property. In the case of a proposed water supply, water budget analysis would be appropriate on the scale of the predicted influence of the well. In its most detailed form, a water budget will account for water transfer between subsurface geological layers.

Typically, the primary water input to an area under study is precipitation. Precipitation will either: 1) evaporate to the atmosphere or be consumed by biological life (evapotranspiration); 2) runoff on the ground surface (runoff); or 3) infiltrate into the ground (recharge). Each of these fates is important to maintain the ecosystem.

Other water inputs that are often considered include water in streams,

runoff from adjacent lands, subsurface water transfer, and man-made influences, such as water from an external source.

Many components of the water balance cannot be measured directly unless substantial time is available to collect a meaningful data set. In the absence of direct measurement, we make assumptions to estimate inputs for the water budget.

Most water budget studies first establish the water balance under existing conditions and then proceed to estimate the water balance under the proposed conditions. If the water budget predicts there will be either a surplus or deficit, measures to counteract these effects are incorporated into the development plan or operational design.

In the case of a residential development, the area covered by houses and paved surfaces will decrease the amount of infiltration.

In the past, water supply development focussed on well capacity by testing the well and demonstrating that it could provide the required water demand. Today, water budget assessments are used to demonstrate that there is sufficient water available to meet the demand without having an adverse effect on other hydrologic or hydrogeologic functions.

Water budgets have always been

a consideration in hydrogeological studies at Jagger Hims Limited. In many cases these were simple and intuitive evaluations included in the assessment. In other cases, they are more complex assessments involving detailed analysis and possibly numerical models. Our team of professional engineers and geoscientists is experienced in water budget and water balance issues and is always available to help.

Jagger Hims would like to gratefully acknowledge the participation of Don Goodyear (Lake Simcoe Region Conservation Authority) in the preparation of this article.

Water Quality Risk Assessment *continued*

committed to the project and met all delivery and milestone objectives within the established time and budget parameters.

Our Source Water Protection team was also occupied throughout 2007 developing the consistent approaches by which all of these water quality risk assessments can be completed.

Work will continue in 2008 with the final deliverables being contingent upon the receipt of updated guidance from the Ministry of the Environment.

OUR LOCATIONS

BRANTFORD

(519) 756-9422

1-866-893-1110

COLLINGWOOD

(705) 444-2788

1-888-285-1272

NEWMARKET

(905) 853-3303

1-800-263-7419

PETERBOROUGH

(705) 743-6850

1-866-818-8366

ST. CATHARINES

(905) 687-1771

1-800-668-2598

WINDSOR

(519) 974-5887

1-800-545-5406



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Phytoremediation *continued*

has been used extensively in the United States to successfully clean up brownfield sites or to prevent contaminated groundwater movement off site. Hybrid poplars act like biological pumps that take up contaminated groundwater. The contaminants are broken down via complex metabolic pathways and the cleaned water is evapotranspired out. Groundwater can also be contained on site. The process rivals conventional pump and treat systems with respect to cost, improves with time, and is capable of complete site clean-up.

The MOE is receptive to this green technology and has approved the site work plan. The hybrid poplars were installed in the fall of 2007.

Kenneth Jobity is actively engaged in building a new biological and bio-process services group within Jagger Hims. The services offered include watershed studies, terrestrial and aquatic evaluations, impact and toxicity studies, municipal and industrial treatment plant performance studies, industrial process optimization and compliance audits, environmental assessments, and heritage evaluations supporting aggregate permit applications and Oak Ridges Moraine conformatory.

Kenneth brings to his new role, a diverse and valuable set of experiences from industry, private sector consulting, the municipal sector and the Ministry of the Environment.