A G E N D A

COMMITTEE MEETING

TOWNSHIP OF WELLESLEY

PLANNING & DEVELOPMENT COMMITTEE

OCTOBER 25, 2011 – 6:45 PM

COUNCIL CHAMBERS - CROSSHILL

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GRAND RIVER CONSERVATION AUTHORITY

REPORT NO. CW-10-11-88 **DATE:** October 13, 2011

TO: Committee of the Whole

SUBJECT: 2011 State of Water Quality in the Grand River Watershed

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Recommendation:

THAT Report No. CW-10-11-88 – 2011 State of Water Quality in the Grand River Watershed be received as information.

Summary:

The current assessment of the state of water quality in the Grand River and its major tributaries is summarized in this report. This assessment is based on the recently completed technical report: "*Water Quality in the Grand River Watershed: Current Conditions and Trends (2003-2008)*" as well as more recent (2009-2010) monitoring data.

Report:

Water quality in the Grand River and its tributaries is a reflection of the geology within the Grand River watershed, land use and land management practices as well as seasonal and the year-to-year variability in climate. The geology sets the natural boundaries of what river water quality to expect while land use; land management activities such as urban development or agricultural production; the alteration of river flows; and biological processes within the rivers are the drivers that contribute to the overall state or condition. In addition, there are differences in water quality among seasons (e.g. summer, winter, etc.) as well as variability from year-to-year as a result of variations in climate (wet year vs. dry year).

The Grand River watershed (the watershed) in south-western Ontario is the largest Canadian watershed that drains to Lake Erie. The watershed supports some of the most intensive agricultural production in Ontario as well as a rapidly growing urban population in the cities of Guelph, Waterloo, Kitchener, Cambridge and Brantford. These factors contribute to the current water quality condition of the reservoirs, river and tributaries.

The river system is currently valued for a variety of aspects and used for many activities. In particular, the river system is valued for the variety of angling and recreational activities; as a receiver of treated wastewater; a provider of drinking water supplies; and sustaining an aquatic ecosystem which supports a variety of valued flora and fauna.

Water quality monitoring is a fundamental part of an overall adaptive management strategy for managing water in a watershed. Monitoring, analyzing the data and reporting on the state or condition of the resource allow for strategic management actions to be planned and implemented. The overall goal of water quality monitoring is to maintain or improve water quality in the watershed.

The Grand River Conservation Authority (GRCA), in partnership with the Ministry of the Environment (MOE), undertakes routine water quality monitoring for the Provincial

Water Quality Monitoring Network (PWQMN). River samples are collected by the GRCA from March through to November at 38 sampling sites and analyzed by the MOE's laboratory for their chemical (nitrogen, phosphorus, chloride etc.) and physical (temperature, pH, dissolved oxygen, etc.) characteristics. These data provide the cornerstone for evaluating the state of the resource and, in many cases, provides the baseline data from which watershed management decisions - such as wastewater treatment plant upgrades or the implementation of a rural water quality program, are made.

In addition, the GRCA maintains seven water quality monitoring stations at sentinel locations on the Grand and Speed rivers to continuously monitor the physical characteristics (e.g. dissolved oxygen, pH, conductivity and temperature) of the river. These data are required for running an in-river model – the Grand River Simulation Model, which is a decision support tool for evaluating key water management approaches (i.e. implementation of advanced wastewater treatment or wastewater treatment plant optimization) to improve water quality. These monitoring and modelling programs combine to provide the baseline information to understand the state of water quality in the watershed. Reporting on aquatic health is more difficult, the focus of a Canadian Water Network research program will focus on developing a framework for aquatic cumulative effects monitoring.

This report is a summary of a recently completed in-depth technical report[1] of the chemical and physical characteristics of the Grand River and its tributaries from 2003 to 2008. Most of the water quality information is limited to the spring and summer seasons so the current state of water quality is limited to those seasons. Specific focus is placed on describing the general water quality in the context of the key water quality issues in the watershed including nutrient (phosphorus and nitrogen), chloride and suspended sediment concentrations. In addition, spatial trends, for example, evaluating how water quality changes from the head waters to the river mouth where it discharges to Lake Erie is explored. Conditions in the river are compared to existing objectives such as the provincial water quality objectives, the federal environmental quality guidelines or established basin-specific benchmarks. Investigation into the relationships between variables (e.g. total suspended sediment and total phosphorus; total phosphorus and flow) is also described in the technical report. A summary of the current state of water quality is shown in Figure 1 using a modification of the Canadian Council of Environment Minister's (CCME) Canadian Water Quality Index - a communication tool that uses metrics to evaluate the dataset, and categorize the water quality as either 'excellent', 'good', 'fair', 'marginal' or 'poor'.

The following summarizes the current state of water quality in the watershed:

Upper Grand River Basin

The upper Grand River subbasin drains the Dundalk till plain. This area generates a lot of runoff during the spring which is captured in two major water bodies: Luther Marsh and Belwood Reservoir. These multi-purpose reservoirs are used to reduce flooding in downstream municipalities during high flow periods but also to augment flows in the river during the summer. Since much of this region is dedicated to extensive agriculture and wetland areas, the water quality upstream of the reservoir tends to be good as

[1] Loomer, H.A., and S.E. Cooke. 2001 "*Water Quality in the Grand River Watershed: Current Conditions and Trends (2003-2008)*".

phosphorus and nitrogen levels are at or maybe slightly above the provincial objectives. Given that Belwood Reservoir receives much of the spring runoff from the headwater region, nutrients tend to accumulate in the reservoir. This, along with internal cycling of nutrients, tends to elevate nutrient levels throughout the summer which promotes the growth of algae in late summer and fall. The reservoir also acts as a source of nutrients to the river downstream.

Conestogo River Basin

The Conestogo subbasin has some of the most intensive agricultural production and some of the most intense municipal and tile drainage networks in the watershed. Very little of the watershed area is treed or has natural wetland areas. The upper subbasin drains a silty till plain, and similar to the upper Grand River subbasin, generates a significant amount of runoff during the spring. The runoff is collected and stored in the Conestogo reservoir to reduce flooding impacts downstream but also to supply water to the lower Conestogo River which then discharges to the Grand River near the village of Conestogo. The reservoir has consistently high phosphorus levels, likely as a result of the upstream runoff but also from internal nutrient cycling, which promotes yearly blooms of algae and cyanobacteria. Similar to Belwood, the Conestogo reservoir also acts as a source of nutrients to the river downstream. Given the geology and land use in this subbasin, water quality tends to be only fair or even marginal with clearly elevated nitrogen and phosphorus levels in the rivers.

Speed / Eramosa River Basin

Some of the best water quality can be found in the Speed/Eramosa River subbasin. The less-intensive land use, high percentage of treed and wetland areas, combined with the local geology – the upper reaches of the Paris-Galt Moraine and the sandier tills located in the upper Speed River subbasin, all combine to have good or even excellent water quality. Runoff from the upper Speed River is collected in Guelph Lake to reduce flooding downstream as well as augment Speed River flows in the summer. Nutrients tend to accumulate in the shallow lake resulting in regular algae blooms. The reservoir is also a nutrient source to the lower Speed River.

The City of Guelph is a large city on a small river. During low flow periods in the summer, the discharge of the Guelph wastewater treatment plant almost equals the discharge from the Guelph dam. However, a commitment to advanced wastewater treatment and wastewater treatment plant optimization goes a long way to minimize the city's impact on the lower Speed River. This is clearly illustrated by the long-term monitoring of dissolved oxygen levels in the lower Speed River at Wellington Road 32. Oxygen levels are maintained above the provincial objective consistently. High nitrate levels in the river downstream of the city, however, are being identified as a concern now and into the future.

Nith River Basin

The Nith River flow is not regulated by large dams and reservoirs. The geology of the upper Nith River basin is a silty till which promotes substantive runoff during the springtime. It also has very intensive agricultural production and a dense municipal and tile drainage network. These factors combine to cause river water quality to be marginal in the headwater region. High phosphorus and total suspended sediments tend to be the predominant water quality issue in the upper and middle Nith River region. As the Nith River flows downstream, however, groundwater influx into the river from the Waterloo Moraine helps to moderate or improve phosphorus levels, especially during the summer.

However, nitrate levels, likely from nitrate-rich groundwater, tend to increase as the river approaches its outlet to the Grand River in the town of Paris.

Central Grand River Region

The central Grand River region contains most of the watershed's population. Water in the Grand River through Fergus and Elora is sustained by discharges from Belwood Lake therefore; water quality in the river is a reflection of the water quality in the reservoir. Generally, nutrient levels in the river are at or slightly above the provincial objectives due to the biochemical processes in the lake (e.g. anoxic bottom waters). The effects of the cities of Elora and Fergus are generally minor on the Grand River, and the resulting water quality through this area is generally fair to good. Furthermore, the water discharged from the Shand Dam is cold and this, combined with good water quality, provides the optimal environment for a world-class brown trout tailwater fishery.

As the Grand River flows toward the Region of Waterloo, it collects flow from the Irvine, Canagagigue and Conestogo. High phosphorus concentrations during spring runoff are characteristic of the strong influence of non-point sources such as runoff from rural land use activities. Nitrate concentrations in these river systems tend to be two to three times higher than those found in the Grand River suggesting that these areas contribute substantially to the overall nitrate load to the Grand River above Bridgeport, especially during the low flows in the winter.

The Canagagigue Creek drains some of the most intensive agricultural lands in the watershed. Nutrient levels in the Canagagigue Creek are among the highest in the watershed. The Woolwich reservoir, built to ensure flows are sustained in the creek during the summer so that wastewater from Elmira can be assimilated, is highly eutrophic. This is a result of the extremely high levels of both total phosphorus and nitrate in the creek that flows into the reservoir. Canagagigue Creek below the town of Elmira is influenced by urban land use activities including road salt application and wastewater treatment plant discharges as is evident by the three-fold increase in chloride levels when compared to upstream concentrations.

As the Grand River flows through the Region of Waterloo, the effluent discharges from the five wastewater treatment plants have a great influence on the water quality in the river, especially during the summer. Very high nitrogen (e.g. ammonia) and phosphorus levels in this reach sustain prolific growth of macro-algae (e.g. Cladophora) and aquatic plants. Consequently, dissolved oxygen tends to fluctuate widely on a daily basis from the activity of the algae/plants causing some areas of the river to have periodic very low dissolved oxygen levels. These factors combine to have marginal to poor water quality within the Region of Waterloo. The Speed River flows into the Grand in Cambridge and, although the Speed River is a large tributary, it does not contribute significantly to the phosphorus levels already in the river. Chloride levels in the central Grand River, however, tend to be strongly influenced by the very high levels found in the Speed.

The Grand River tends to recover as it flows toward Paris from Cambridge, likely a result of the river flowing through a steep valley with a significant elevation change so that the river meanders through many riffle sections and gets re-oxygenated. Water quality also improves, likely as a result of a significant influx of groundwater, which helps to moderate the nutrient levels in the river.

At the southern end of the central Grand River region is an area referred to as the *Exceptional Waters* reach. The reach of the Grand River between Paris and Brantford brings together the right aquatic conditions that allow for a thriving warm-water fish

community yet seasonally, it can support cold water and migratory fish. Cold water entering the river from upstream groundwater discharges in the Grand and Nith Rivers, as well as Whiteman's Creek - a cold water creek, help to moderate the water quality in this region. All of these factors combine to make the reach between Paris and Brantford good habitat for a wide range of species including smallmouth bass, walleye, northern pike and a unique resident population of rainbow trout. It is also home to several fish species at risk, such as the eastern sand darter which are found in few locations in Canada.

Southern Grand River Region

The water quality in the southern Grand River subbasin is largely a reflection of the cumulative inputs from upstream, the underlying geology of the Haldimand Clay plain and the general morphology of the river (i.e. gently sloping topography which provides for a slow moving river). Although the City of Brantford is the only major urban area within this region, it appears to have a relatively minor influence on the large river. As the river flows onto the clay plain, sediment becomes suspended in the water column and the river becomes turbid. This phenomenon is the mechanism that helps to maintain high levels of phosphorus in the river as it flows downstream toward Dunnville and Port Maitland on Lake Erie. On the other hand, the high turbidity is a suitable environment for walleye, a highly valued fish species in the southern Grand.

The effects of dams on the lower Grand River are evident. The river's flow is slowed down and water tends to be impounded behind both the Caledonia and Dunnville dams. Total phosphorus levels tend to be elevated above the dams which suggest a build-up of fine sediments behind the dams. Consequently, these on-line dams/weirs both accumulate nutrients and recycle nutrients to the lower river. Further, periods of low oxygen in the river has also been shown through intensive monitoring surveys between Cayuga and Dunnville and pollution tolerant benthic organisms were found downstream of Cayuga during surveys done by the Ministry of Natural Resources between 2003-2005.

Overall, the water quality tends to be marginal to poor at the water quality monitoring sites in the southern Grand River. The high phosphorus levels in the river at Dunnville, about four to as much as ten times above the provincial objective of 0.03 mg/L, are generally considered to be a substantive contribution to the nearshore of the eastern basin of Lake Erie.

Although water quality in the Grand River ranges from good to poor, many programs are in place to improve water quality in the watershed:

- A substantive investment ($720M over 10 years) in advanced wastewater treatment by the Region of Waterloo will greatly improve river water quality, both locally and for downstream users;
- Wastewater treatment plant optimization, as demonstrated by the City of Guelph and Haldimand County, as well as through the Grand River Watershed-wide Wastewater Optimization Pilot, also contributes to better river water quality through improved effluent quality and a reduction in the frequency and severity of spills and bypasses into the river;
- The Rural Water Quality Program continues to provide cost-sharing programs to implement best land management practices to reduce rural nonpoint source pollution;
- Urban stormwater management programs, such as those implemented by the Cities of Kitchener, Waterloo and Guelph, ultimately benefit the Grand River through reduced sediment loads; and

- Stream restoration efforts from a variety of community groups such as Friends of Mill Creek and Trout Unlimited contribute to improved aquatic conditions

FINANCIAL IMPLICATIONS:

Not applicable

OTHER DEPARTMENT CONSIDERATIONS:

Not applicable

Prepared By:

Sandra Cooke

Sandra Cooke
Senior Water Quality Supervisor

Approved By:

Dwight Boyd
Director, Engineering

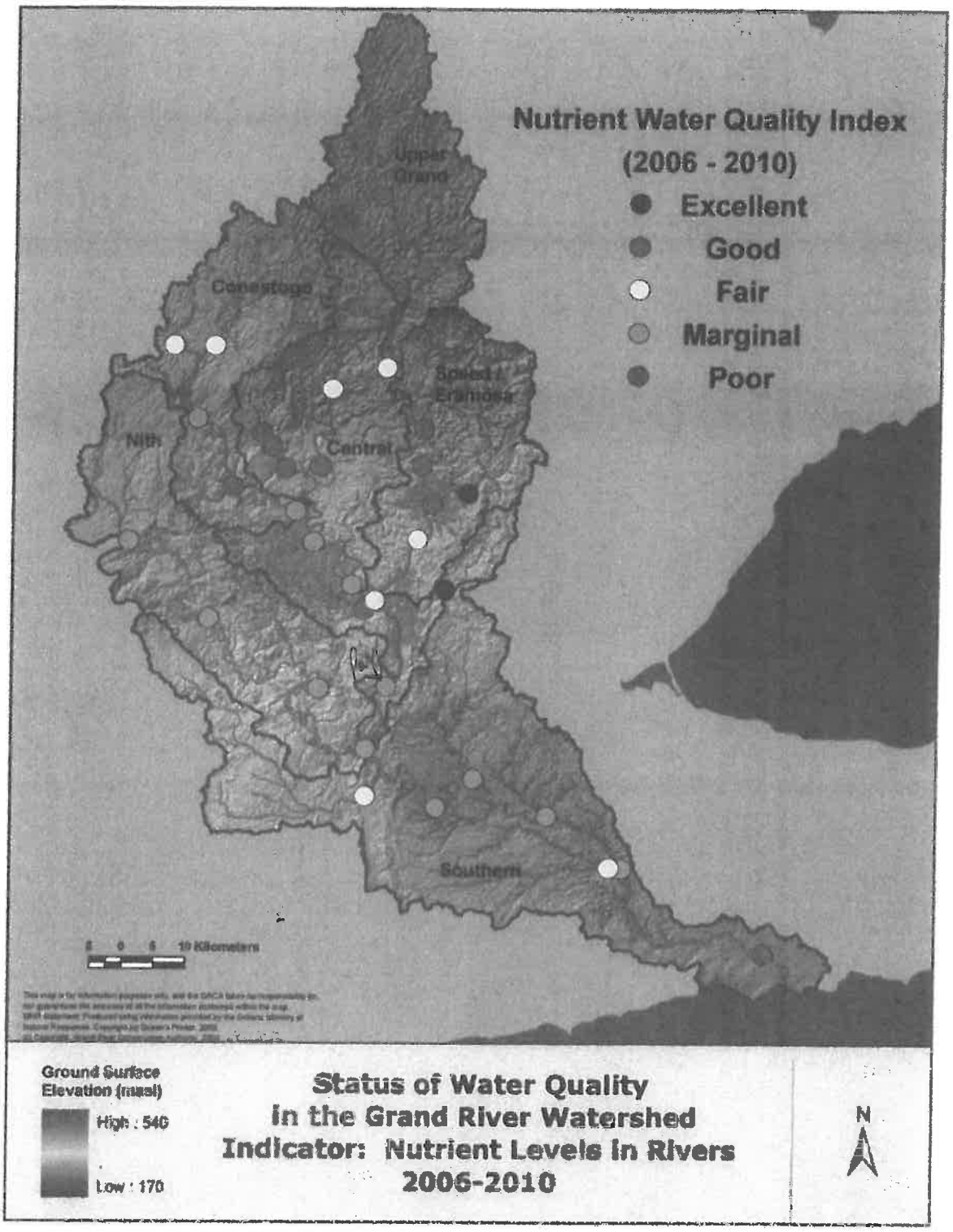

Figure 1. The current state of water quality using a water quality index to categorize nutrient levels at long-term water quality monitoring sites in the Grand River watershed from 2003-2008. Note the six major subbasins within the watershed.

GRAND RIVER CONSERVATION AUTHORITY

REPORT NO. CW-10-11-89 **DATE:** October 13, 2011

TO: Committee of the Whole

SUBJECT: Summary of Prosecution under Section 28(16) of the *Conservation Authorities Act*

RECOMMENDATION:

THAT Report No. CW-10-11-89 – Summary of Prosecution under Section 28(16) of the *Conservation Authorities Act* be received as information.

SUMMARY:

Jason John Geil, Geil Style Enterprises Inc. and Janet Ann Bratton were convicted under Section 28(16) of the *Conservation Authorities Act* for development without a permit at 1943 Roseville Road, Township of North Dumfries. The landowners were ordered to rehabilitate the disturbed area of the wetland by November 24, 2011 and fined a total of $15,625 (including the victim surcharge).

REPORT:

In August 2009, staff received complaints that the landowners of 1943 Roseville Road, Township of North Dumfries were bringing in loads of fill material and dumping them in a regulated area on the property. Grand River Conservation Authority (GRCA) staff attended the scene and also witnessed large construction equipment in the area of the wetland.

In January 2010, the GRCA laid three charges against the landowners of 1943 Roseville Road, and proceeded to a two day trail in September 2010. On January 26, 2011, Jason John Geil, Geil Style Enterprises Inc. and Janet Ann Bratton were each convicted on these charges in Provincial Offences Court.

Subsequent to the conviction, in September 2011 the parties were sentenced by the court. The court order includes a rehabilitation order, term of probation, and fines. The rehabilitation order includes removal of the foreign fill material from the wetland and the area adjacent to a tributary of Cedar Creek and this area will re-establish a wetland community. In addition to the rehabilitation order, the convicted parties were fined a total of $15,625 (including the victim surcharge). Jason John Geil received the maximum fine allowable under the legislation of $10,000 and a term of probation of ninety days, Geil Style Enterprise Inc. was fined $1,000 and a term of probation of ninety days, and Janet Ann Bratton was fined $1,500.

Under the order GRCA staff are permitted to inspect the rehabilitation work at 1943 Roseville Road. The order also outlines specific items and actions such as: the area of the property to be rehabilitated, the landowner will notify GRCA before the work proceeds and confirm that the excavated fill will be dumped in a location outside the GRCA regulated area, GRCA staff will be on site to confirm that the fill is removed in an adequate manner etc. All works identified within the rehabilitation order shall be completed by November 24, 2011.

(8)

The rehabilitation order has been registered on title to the property.

FINANCIAL IMPLICATIONS:

From 2009 to September 2011 the legal expenses for this prosecution are $24,859.13.

STRATEGIC PLAN GOAL: Goal 1: Improve Watershed Health
(Item 11 Implement Generic Regulation)

OTHER DEPARTMENT CONSIDERATIONS: Not Applicable

Prepared By:

Samantha Lawson,
Supervisor of Resource Planning

Approved By:

Nancy Davy,
Director of Resource Management

PLANNING & DEVELOPMENT
Township
File No: 122/11

TOWNSHIP OF WELLESLEY
PLANNING REPORT - MINOR VARIANCE APPLICATION A7/11

Property Owner:	David B. Bauman
Agent:	Eli Sherk
Date of Application:	October 3, 2011
Location:	Con. 12, Lot 7, East Sec Municipal Address: 4437 Ament Line
Roll Number:	15-3024-030-004-10700
Zoning:	'A1' – General Agricultural
Twp. Official Plan:	Agricultural Resource Area

EXPLANATION

The property owner of 4437 Ament Line has submitted an application for a minor variance for relief from the Minimum Distance Separation requirements of the Zoning By-Law (28/2006).

DISCUSSION

The subject property is located on the north side of Ament Line. The property is zoned 'A1' – General Agricultural and is within the Agricultural Resource Area. The property has an area of 96.94 acres and a frontage of approximately 1,035 ft.

The applicant applied for a Building Permit to construct a covered yard and partially-slated liquid manure pit on September 22, 2011.

It was determined by Township staff and then verified by OMAFRA staff that the proposal did not comply with Minimum Distance Separation II (MDS II) requirements. Specifically, the proposed covered yard and partially-slated liquid manure pit are closer to the nearest neighbour's dwelling and are closer to a Type B land use (Martin's Mennonite Church) than the minimum distance required by MDS II requirements.

The applicant has chosen to apply for a variance to permit the proposed covered yard and partially-slated liquid manure pit to be constructed as per his original application.

Proposed Covered Yard (30' x 40')

The nearest neighbour's dwelling to the proposed covered yard is across the street at 4438 Ament Line. That house is approximately 453 ft away from the proposed covered yard. MDS II requires that the proposed covered yard be at least 618 ft away from the house.

The church at 4401 Ament Line is considered to be a Type B use. Type B land uses are typically characterized by uses that have a higher density of human occupancy, habitation or activity. For the purposes of MDS II, Type B land uses include areas zoned or designated settlement area, institutional, or commercial. The church property is approximately 472 ft away from the proposed covered yard. MDS II requires that the proposed covered yard be at least 1,235 ft away from the church property line.

Proposed Partially-slated Liquid Manure Pit (36' x 44')

The nearest neighbour's dwelling to the proposed partially-slated liquid manure pit is across the street at 4438 Ament Line. That house is approximately 427 ft away from the yard. MDS II requires that the yard be at least 618 ft away from the house.

The church property is approximately 456 ft away from the proposed partially-slated liquid manure pit. MDS II requires that the yard be at least 1,235 ft away from the church property line.

SITE VISIT

Township staff visited the property on October 7, 2011 to understand why it is not possible for the proposed development to comply with MDS II requirements.

Proposed Covered Yard (30' x 40')

There is an existing uncovered yard on the subject property. It is legal non-conforming to MDS II requirements as it was constructed prior to the passing of the Nutrient Management Act. The property owner is simply proposing to cover it. The cover requires a building permit and MDS II applies to manure/livestock facilities at the time of a new building permit.

The property owner wants to cover the yard to remedy an existing situation. The uncovered yard allows precipitation to get into the yard which causes increased manure runoff especially at times of high precipitation.

Proposed Partially-slated Liquid Manure Pit (36' x 44')

The owner does not currently have a liquid manure pit. The pit is proposed to be located on the south side of the barn and the yard because the grade of the land slopes from

the north, down to the south. The liquid manure pit needs to be at a lower grade than the barn and the yard because the liquid manure will be conveyed from the barn and the yard to the partially slated pit via gravity.

The property owner wants to construct a partially slatted liquid manure to remedy an existing situation. Currently, the property owners needs to spread the liquid manure (mostly generated by hogwash) on his field every eight (8) weeks throughout the year because his hogs are on an eight-week cycle and it is required for sanitation reasons to clear out the hog area of the barn prior to starting a new hog cycle.

With the proposed partially-slated liquid manure pit, the property owner would be able to store the liquid manure generated throughout several cycles. He would only need to spread the liquid manure on the field twice a year (once during spring and once during fall) as opposed to spreading it throughout the year, even during the winter when there is snow on the fields.

Furthermore, the property owner believes that the partially-slatted liquid manure pit will actually mitigate current odours experienced by neighbours because the manure will be disturbed less often and will be spread less often.

CONCLUSION

In conclusion, Township staff believe that the proposed changes, although they do not comply with MDS II, will be a benefit to both the environment and to the neighbours.

It has been determined by Township staff that the proposed changes are minor in nature and the proposed variances maintain the general intent and purpose of the Township of Wellesley Official Plan and Zoning By-law 28/2006.

RECOMMENDATION

That the Council of the Township of Wellesley accept the comments in this report and forward this report to the Committee of Adjustment for their consideration in the matter of application A7/11.

Sarah Peck, MSc PL
Junior Planner
Township of Wellesley

Approved by: S.J. Duke, EDC/Clerk, October 13, 2011

PLANNING & DEVELOPMENT
Township
File No: 123/11

A7/11
MINOR VARIANCE APPLICATION
DAVID B. BAUMAN

Figure 1: Key Map of 4437 Ament Line

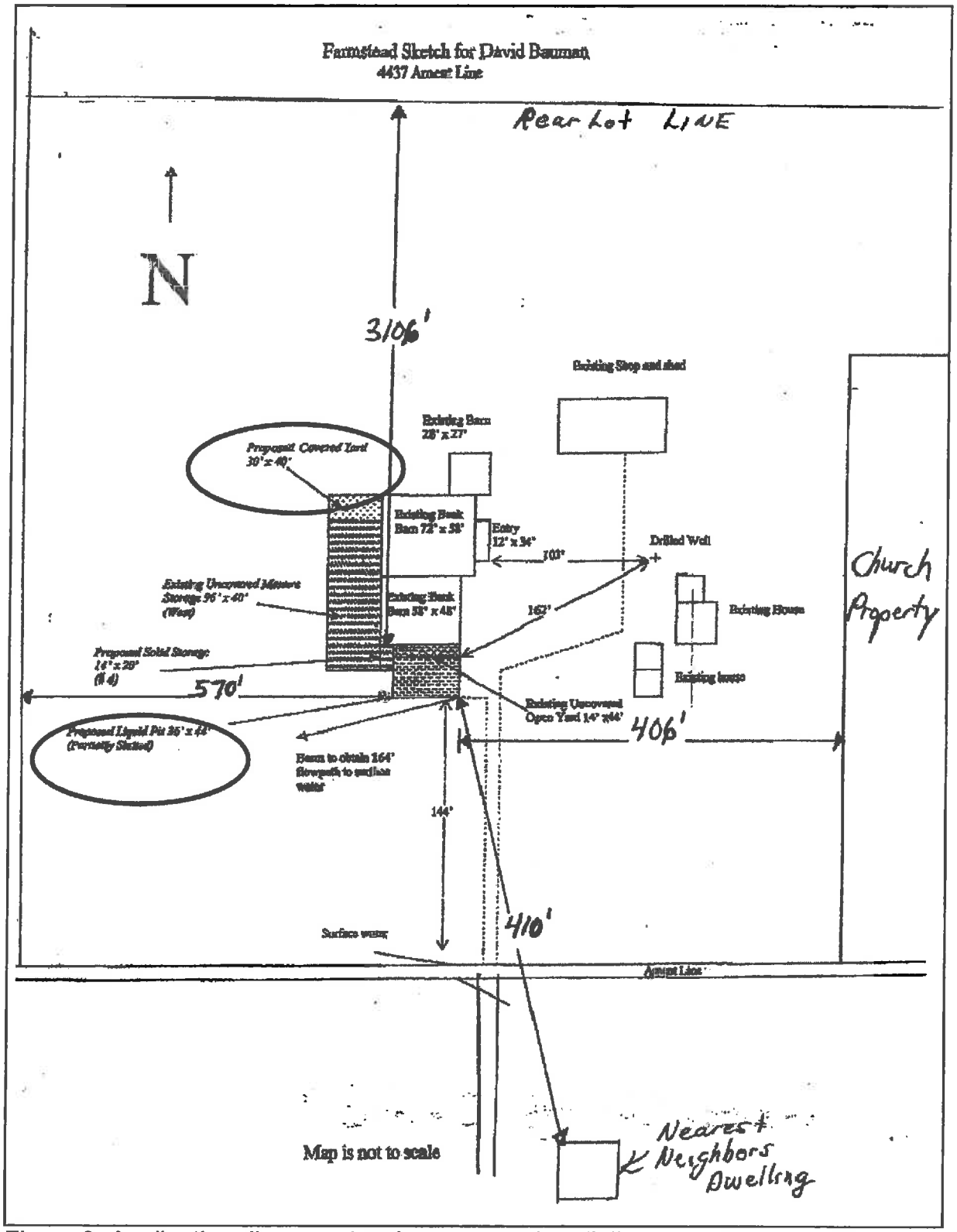

Figure 2: Application diagram showing proposed partially-slatted liquid manure pit and proposed covered yard

MDS II Summary – Covered Yard (30' x 40')			
Description	Multiplier	Required Storage Setback	Actual Storage Setback
Nearest neighbour's dwelling	1.0	188 m 618 ft	138 m 453 ft
Type A land uses	1.0	188 m 618 ft	N/A
Type B land uses	2.0	376 m 1,235 ft	144 m 472 ft
Nearest lot line (side or rear)	0.1	19 m 62 ft	144m 476 ft
Nearest road allowance	0.2	38 m 124 ft	88 m 289 ft

MDS II Summary – Partially stated liquid pit (36' x 44')			
Description	Multiplier	Required Storage Setback	Actual Storage Setback
Nearest neighbour's dwelling	1.0	188 m 618 ft	130 m 427 ft
Type A land uses	1.0	188 m 618 ft	N/A
Type B land uses	2.0	376 m 1,235 ft	139 m 456 ft
Nearest lot line (side or rear)	0.1	19 m 62 ft	124 m 407 ft
Nearest road allowance	0.2	38 m 124 ft	44 m 144 ft

Site of Proposed Covered Yard (30' x 40')

Site of Proposed Partially-slated Liquid Manure Pit (36' x 44')