

Comments on “Provision of Information – Category 3 PTTW Application – Future Stages – Findlay Creek Village Subdivision” (PTTW010-4670)

1. Introduction

I was asked by Ecojustice to comment on the “**Provision of Information – Category 3 PTTW Application – Future Stages – Findlay Creek Village Subdivision**” (PTTW010-4670) in the context of the PTTW application of July 2008 (PTTW010-1034) and the review comments which had been submitted. As this Provision of Information is an amendment and augmentation of the previous PTTW Application, I wish to state first that I am in accord with the critical hydrogeological comments offered previously by Dr. Fred Michel.

2. The timing of submission of “Provision of Information”

The additional requests made in this application so soon after the original proposal, at the very least, suggests poor planning on the part of Findlay Creek Co-Tenancy or Golder Associates Inc or both. However, as documented earlier by Dr. Michel the previous PTTWs, all of short duration, each were for successively higher daily rates of pumping. This suggests that a lack of appropriate planning is endemic with this applicant.

3. Inadequate Substantiation of Potential Environmental Impacts

In both letters of August 29, 2008 and September 12, 2008 to Mr. Peter Taylor of MOE, Mr Paul Smolkin of Golder states “*It is anticipated that the temporary management/diversion of water in these two areas will not result in any adverse effects on the environment. There are no potential effects on groundwater levels in the wetland (or elsewhere) anticipated; the current groundwater monitoring program will be ongoing during the duration of the FCE work.*” These claims are unsubstantiated and similar to previous assurances of no impact given by Golder when in fact Golder’s groundwater monitoring results have recorded significant groundwater drawdown.

3a. Adverse Environmental Impacts have Occurred

In May, June and July 2007, I observed the adverse effects, such as, the killing of plants in the north-east of the “protected” wetland resulting from flooding of this portion of the wetland while the applicants were operating under a similar assurance of no environmental impact. In addition on July 19, 2007, I observed the groundwater level at 0.8 m below surface at a location a distance of 50 m inside the “protected” zone on the eastern side of the Leitrim wetland. This water level monitor was well into the glacial till underlying the peat soil surface layer. Thus the peat and the vegetation in this portion of the wetland were experiencing adverse environmental stress brought on by the construction activity and drainage for construction which had occurred and was ongoing to the north-east of my observation point. At the time of my observation there were intermittent pools of water maintained at the surface by a slowly permeable interface between peat and mineral soil layer, resulting in perched water pools. The groundwater drawdown was not observable from surface observations alone but was occurring because of lowered groundwater in the Findlay Creek Village development. Close examination of water

level records for bore holes in this region of the wetland given in Golder's groundwater monitoring report confirm my groundwater observation, as is presented below.

Adverse environmental impacts have been occurring while Golder was supposedly "on watch" with the monitoring program and nothing was done to minimize the effects.

3b. Damagingly Dangerous Groundwater Drawdown has not Initiated Remedial Action

Golder's claim that "*there are no potential effects on groundwater levels in the wetland (or elsewhere) anticipated*" is unsubstantiated and wrong. In making such a claim, Golder ignores the groundwater level data and the geological background information which they have provided in support of PTTW010-1034. The upper soil layers of the Leitrim wetland in the region of the Findlay Creek Extension planned activity are peat of variable depth underlain by fine sandy silt. Both soil layers are water deposited with peat developing under stagnant water and sandy silt deposited from water flowing at varying velocities. This mode of deposition of sandy silt often gives rise to layers of differing grain size. The horizontal permeability to water is almost always, greater than the permeability in the vertical direction. Thus additional pumping activity along the Findlay Creek Extension at the northern boundary of the "protected" wetland has a great potential for initiation of rapid consequential drainage of the wetland.

In 2007, I made *in-situ* measurements of hydraulic conductivity (i.e. permeability to water) at three sites along the edge of the "protected" wetland, including along the Findlay Creek Extension (report at http://greenspace-alliance.ca/files/Topp_Report.pdf). The permeability of the sandy silt to the south of the FCE was measured to be 40 times higher than the permeability of the glacial till soil at the eastern side of the "protected" wetland. With soils of this high permeability all along the Extension, there will be a steady drawdown of the groundwater by construction of this Extension and the associated pumping for construction that would go to a depth of 1.5 m. The huge drawdown of the groundwater in the eastern part of the "protected" wetland (0.8 m below surface at 50 m west of berm) in the less permeable till implies a much more serious drawdown south of the Findlay Creek Extension if only because of the much more permeable soil along it. This is not consistent with the Golder claim: "*There are no potential effects on groundwater levels in the wetland*".

An analysis of Golder's water level monitoring data along with weather data shows that pumping and ongoing construction activity has already adversely affected groundwater levels in numerous boreholes both inside the "protected" wetland and adjacent to it. Golder has insisted that the observed effects are weather caused or has simply ignored their own data. My analysis has found that years 2004 and 2007 had identical total precipitation during the 10 month period which would influence groundwater levels in the Leitrim wetland during the May to October periods in those years. As precipitation is the major factor influencing non-impacted natural wetlands, comparison between groundwater levels recorded by Golder in 2004 and those recorded in 2007 would indicate the impact on groundwater levels as pumping and construction has proceeded.

BH03-07A and B, and BH03-09 A and B, well within the "protected" region and near the important wetland fen, all show disturbingly large water level drops in 2007 but not so in 2004. BH03-07 A and B showed drops as large as 0.6 m below the designated trigger level in 2007

whereas in 2004 the drops barely reached the trigger level. (Figs 9 and 11, Golder Monitoring Report). BH97-2 A and B and BH03-10 A and B are at the eastern side of the “protected” wetland, with BH97-2 at 30 m west of the berm and BH03-10 just east of the berm. In 2004, none of the four boreholes declined to the trigger levels. By contrast, in 2007 the groundwater levels were well below the same trigger level for extended periods in the June to October season (Figs 12 and 13, Golder Monitoring Report). BH03-08 showed different behaviour in the overburden (B) from that in the bedrock (A). In both 2004 and 2007 the overburden BH03-08B did not fall often below the trigger level. At BH03-08A in the bedrock the groundwater level was never down to the trigger level in 2004 but was as much as 0.7 m below the trigger point from June to October with only one small interval above the trigger level. (Fig 10, Golder Monitoring Report). These observations show a great difference in groundwater level drawdown in 2004 compared to that which occurred in 2007. There was equal precipitation in the first 10 months in both years. The much larger and highly consistent drawdown of groundwater levels in 2007 well within the “protected” wetland is very strong evidence that continuing intermittent pumping during previous PTTWs and subsequent construction has already caused measureable increasing impact to the groundwater levels in the Leitrim wetland.

Golder has maintained that rapid recovery of groundwater levels after cessation of pumping indicates the pumping has not adversely impacted the Leitrim wetland. As no analyses have been reported, this claim is unsubstantiated. Sufficient documentation to support such a broad generalized claim would require analyses of the groundwater response to initiation and cessation of pumping, i.e. detailed records of pumping rates and duration. All such analyses would have to take into account the impact of precipitation. A validation of this claim would depend critically on access to actual data, not graphical representations. As these data have not been released by Golder, then the burden of proof of the claim should rest with Golder.

The long periods when groundwater levels were recorded as being over 0.5 m below the trigger levels in 2007 did not cause any remedial action to be initiated. Groundwater monitoring was going on in 2007 when damagingly dangerous drawdown was occurring. Remedial action was not taken during groundwater drawdown in 2007

4. Conclusion

There is ample evidence now available both from my own measurements and observations and from appropriate analysis of the Golder groundwater monitoring data that environmental degradation of the “protected” wetland, along with devastating groundwater drawdown have already occurred. Accordingly, it is reasonable to anticipate further degradation of the “protected” wetland and additional extensive groundwater drawdown during the ten-year period of the PTTW application and particularly during the Findlay Creek Extension construction.

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