DARRYL M. ROBINS CONSULTING
CIVIL & ENVIRONMENTAL ENGINEERING

M09010

January 5, 2012

Mr. Troy Cameron, Assistant Public Works Manager
The Municipality of Northern Bruce Peninsula
56 Lindsay Road 5, RR # 2
Lion's Head, ON
N0H 1W0

Mr. Leo-Paul Frigault, Cluster Manager
Ontario Clean Water Agency
PO Box 310
315 George Street
Wiarton, Ontario
N0H 2T0

Re: 2011 Annual Report for Lakewood Subdivision Sewage System
Municipality of Northern Bruce Peninsula

Dear Mr. Cameron & Mr. Frigault,

Darryl M. Robins Consulting Inc. (DMRC) is pleased to provide the following Annual Report for 2011. The following report outlines key elements of the sewage system and provides a brief discussion of the Consultant's observations at the site inspection. Please find attached to this report the Annual Inspection Summary from November 15, 2011 and Table No.'s 1 and 2.

The Ontario Clean Water Agency (OCWA) is the responsible authority for operation and maintenance duties of the sewage system under contract to the Municipality of Northern Bruce Peninsula (Municipality). OCWA began these duties on July 1, 2009.

Sewage System Capacity:

From the records provided by the Municipality and OCWA as of November 15, 2011, there are currently 37 dwellings connected to the Lakewood Subdivision Sewage System. The original Certificate of Approval specified that each dwelling would be allotted a daily sewage flow of 1,200L/day for a maximum of 48 lots; therefore, the ultimate design daily sewage flow for the sewage system is 57,600L/day. With 37 dwellings online at present, the calculated daily sewage flow should be 44,400L/day.

OCWA has been maintaining records of the readings on the elapsed hour meters of the sewage dosing pumps for the tile field (See Table 1).

During normal operation it appears that the pumps are dosing the tile field with an average volume of approximately 7,116 L/day based on the respective pumping rates determined by the pumping tests conducted by the OCWA and DMRC at the site meeting. These pumping rates should be used by OCWA personnel in recording and evaluating flows at the facility. The results from the dosing pump records suggest that the actual sewage flows being received by the system are substantially less than the design and that the sewage system should have sufficient capacity for completion of Phases 1 and 2B of the

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subdivision. The average daily sewage flow for 2011 (7,116 L/day) is approximately 51% higher than that determined for 2010 (4,699 L/day).

Sampling Results:

OCWA took a sample of the sewage effluent during the 2011 annual inspection. The sample was analyzed by SGS Lakefield Research Limited and the results are shown on Table 2 (attached). The results of the Lakewood Subdivision sewage effluent sampling for the 2011 sampling event indicate that the sewage effluent is within typical values and there are no adverse results within the parameters tested to suggest unsuitable treatment for discharge to the tile fields.

Physical Conditions of the Sewage System

DMRC's inspector walked around the tile field and septic tank area during the inspection. The tile field appeared to be in good condition with no concerning conditions observed, except for a few locations that had been disturbed (lack of vegetation), most likely due to lawnmowing operations. These areas were common at the corners around the top of the bank of the tile field. Applying more topsoil and seeding the respective areas in the spring is recommended.

There was an occasional sewage odour around the access riser of the dosing tank and this odour became prominent upon opening the access riser lid of the dosing pump enclosure; however, the odour appeared to be from normal operation. Part of the rusty handles of the valve stems crumbled away when they were operated. It is recommended that the valve stems be replaced.

The pump control panel and the dosing chamber appeared to be in good working order. The autodialer system was not able to "call-out" during the inspection. OCWA reported that they have been working to arrange to have problems with the phone line rectified so the alarm dialer can function adequately. On December 16, OCWA reported that the dialer has been replaced and it is now functioning.

The splitter valve chamber was inspected and although the chamber did contain some water, there appears to be no need for concern and the valves are above the water level. OCWA indicated that they would install a seal to prevent water from infiltrating into the structure.

OCWA has reported that there were no deficiencies reported during their fall 2011 inspection of the collection system. OCWA had installed the polyseals to prevent water from entering the maintenance holes, on November 9 2011. They appeared to be collecting stormwater.

Annual Report Recommendations

1. The "Dosing Pump Elapsed Time Weekly Record Sheets" provided in the Operations and Maintenance Manual originally provided by Henderson Paddon & Associates for recording and collecting data on dosing pump operation should continue to be used by operations staff. The new pumping rates should be used for recording and evaluating sewage volumes for the facility. Operators should also continue to keep a project–specific journal of their site visits, alarm conditions, maintenance, repairs and observations.
2. Operations staff should continue to monitor the air relief valve at SANMH2.
3. The Municipality should update the existing Operations and Maintenance Manual to accurately incorporate the upgraded dosing pump components.

4. Topsoiling and seeding should be undertaken on disturbed areas along the top of slopes and on disturbed areas of the tile field.
5. OCWA and the Municipality should consider replacing the effluent discharge control valve stems.

It is the writer's overall opinion that the system is in good working order, and that the housing development within Phases 1 and 2B of the subdivision should continue with regards to the available capacity of the subdivision's existing sewage system.

Should you have any questions or concerns with the above and enclosed, please do not hesitate to contact the writer.

Yours truly,

DARRYL M. ROBINS CONSULTING INC.

Laura Swanson, P.Eng.
Civil-Environmental Engineer

LAS/br
Encl.

Cc: Mr. Bob Graham, CPHI, Public Health Inspector, Grey Bruce Health Unit
Mr. John Nichol, Lakewood Subdivision Ratepayer's Association
Mr. David Trombley, OCWA (via email)

DARRYL M. ROBINS CONSULTING INC.

CIVIL & ENVIRONMENTAL ENGINEERING

INSPECTOR'S REPORT:

Project Title:	Lakewood Subdivision	**Inspection Date:**	Nov 15, 2011
Inspector:	Darryl M. Robins, P.Eng	**Inspection Time:**	10:00 am
Location:	Lakewood Subdivsion	**File No.:**	M09010

- The writer met with Mr. Leo-Paul Frigault (Operations Manager, OCWA) and Mr. Paul Mader (Operations, OCWA) on November 15, 2011 at 10:00 am. Mr. Mader provided a summary of inspections and work completed in 2011.

- The 2nd compartment of the septic tank was opened. It appeared to be full. Mr. Mader grabbed a sample of sewage from the bottom of the compartment. The sample was translucent. It was observed that there was not a significant buildup of sludge at the bottom (and corners of the 2nd compartment of the tank).

- Mr. Mader took samples of the sewage effluent from the dosing chamber at the facility for lab analysis.

- The writer walked over the tile field looking for any signs of vandalism, rodent infestation, erosion or breakouts. No deficiencies at the tile field were noted. It may be useful to re-topsoil and seed disturbed areas where the lawnmower has churned up the sand of the tile field. This was typically observed on the corners at the "top of bank" on the tile field.

- The Municipality has informed that eleven (11) new residences have been connected to the collection system within the last year for a total of 47 dwellings currently serviced by the subject sewage system.

- There was a detectable septic odour encountered when the access riser lid and the dosing pump enclosure were opened. Prior to the opening of the lid, the area around the septic tank was relatively odour free.

- The discharge control valve stems (dosing chamber) that control discharge to the tile fields were operable, however part of the rusty handles crumbled away.

- An inspection of the splitter valve chamber to the tile fields was conducted. There were no deficiencies noted. The chamber did contain some water; the valves were above the water level. Mr. Mader indicated that he would remove the water. The water was clear and expected to be from infiltration. Mr. Mader indicated that he would install a poly-seal (bowl) in the splitter valve chamber.

- The control panel, enclosure and associated equipment appeared to be in good condition and operating normally.

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- The writer observed the elapsed time meters at Pump No. 1 and 2 in operation during trials of dosing cycles at the site meeting. The elapsed time meter readings were noted at:

  Pump No. 1: 351.75 hr
  Pump No. 2: 268.56 hr

- Pumping rate tests were conducted on the effluent pumps at this inspection. The resulting effluent pump rates were:

  Pump No. 1: 224.0 L/min
  Pump No. 2: 213.0 L/min

- OCWA reported that the annual inspection of the maintenance holes was conducted on November 9, 2011. The excess water was removed and the poly seals (bowls) were installed to prevent water from entering the maintenance holes. Mr. Mader reported that OCWA had been monitoring the system and no malfunctions or leakage had been noted in the operating period.

- Digital photos of the existing conditions of the sewage system were taken and are saved under the project file number at DMRC.

- A test on the high level alarm was conducted at the site meeting. The alarm beacon and high level alarm light on the control box appeared to be in satisfactory working condition. An alarm call out did not appear to be received on the designated phone numbers. Mr. Mader had reported that the alarm dialer is not working. There are problems with the phone line. They expect that it will be operational in the next month. Mr. Mader also said that that the alarm dialer hardware had been replaced. The alarm autodialer system information (for the record) is as follows:

  Station telephone number: 519-793-4434
  PIN 1234 (For User)
  777444 (For Installer)

  On December 16, 2011 OCWA confirmed that the autodialer was now functioning. The alarm dialer will call out for the following conditions:

  a) Pump Failure
  b) High Level Alarm
  c) Power Failure

  The current alarm call-out protocol is as follows:

  1. OCWA operator on-call cell phone 519-372-3034
  2. Leo-Paul Frigault cell phone (OCWA Operations Supervisor) 519-379-2225
  3. Cellular Phone for OCWA's Area Supervisor
  4. Municipality of Northern Bruce Peninsula Supervisor

- It was reported by Mr. Mader that the septic tank at the facility had not been pumped this year.

Report finalized on December 16, 2011.

DARRYL M. ROBINS CONSULTING INC.

Laura Swanson, P.Eng
Civil – Environmental Engineer

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TABLE 1
DOSING PUMP RECORDS
(ELAPSED TIME METER READINGS)
LAKEWOOD SUBDIVISION
OCTOBER 19, 2010 TO NOVEMBER 14, 2011

DATE		PUMP NO. 1					PUMP NO. 2					COMBINED AVERAGE DAILY FLOW (L/d)	OPERATOR'S NOTES
	TIME	RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (hr)	VOLUME PUMPED (L)	ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)	RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (hr)	VOLUME PUMPED (L)	ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)		
19-Oct-10	09:30:00	233.50					180.70						OK
29-Oct-10	14:00:00	235.69	2.19	29,434	10.19	2,889	182.59	1.89	24,154	10.19	2,371	5,260	OK
04-Nov-10	11:30:00	237.13	1.44	19,354	5.90	3,283	183.68	1.09	13,930	5.90	2,363	5,645	OK
10-Nov-10	13:10:00	238.86	1.73	23,251	6.07	3,831	184.97	1.29	16,486	6.07	2,716	6,547	OK
18-Nov-10	08:00:00	240.70	1.84	24,730	7.78	3,177	186.58	1.61	20,576	7.78	2,643	5,820	OK
25-Nov-10	08:00:00	242.55	1.85	24,864	7.00	3,552	187.99	1.41	18,020	7.00	2,574	6,126	OK
01-Dec-10	13:40:00	244.35	1.80	24,192	6.24	3,879	189.40	1.41	18,020	6.24	2,890	6,769	OK
09-Dec-10	09:40:00	246.41	2.06	27,686	7.83	3,534	190.08	0.68	8,690	7.83	1,109	4,644	OK
17-Dec-10	08:10:00	248.28	1.87	25,133	7.94	3,166	192.19	2.11	26,966	7.94	3,397	6,564	OK
22-Dec-10	08:15:00	249.54	1.26	16,934	5.00	3,385	193.00	0.81	10,352	5.00	2,069	5,453	Pump #2 overload, reset OK, start 15:00
24-Dec-10	08:15:00	250.75	1.21	16,262	2.00	8,131	193.04	0.04	511	2.00	256	8,387	Pump #2 overload, reset OK, start/stop
30-Dec-10	09:00:00	253.33	2.58	34,675	6.03	5,749	194.42	1.38	17,636	6.03	2,924	8,673	OK
06-Jan-11	14:45:00	256.60	3.27	43,949	7.24	6,071	196.31	1.89	24,154	7.24	3,336	9,407	OK
14-Jan-11	10:45:00	258.44	1.84	24,730	7.83	3,157	197.69	1.38	17,636	7.83	2,251	5,408	RUNNING # 1 OK
20-Jan-11	10:30:00	259.53	1.09	14,650	5.99	2,446	198.75	1.06	13,547	5.99	2,262	4,708	OK
28-Jan-11	10:45:00	261.57	2.04	27,418	8.01	3,423	199.77	1.02	13,036	8.01	1,627	5,050	OK
04-Feb-11	10:15:00	264.72	3.15	42,336	6.98	6,066	199.82	0.05	639	6.98	92	6,158	RESET # 2 PUMP OK
10-Feb-11	08:30:00	266.28	1.56	20,966	5.93	3,537	200.72	0.90	11,502	5.93	1,941	5,478	OK NO ALARM
17-Feb-11	13:00:00	267.78	1.50	20,160	7.19	2,805	202.07	1.35	17,253	7.19	2,400	5,205	RUN PUMPS OK
25-Feb-11	12:50:00	269.83	2.05	27,552	7.99	3,447	203.50	1.43	18,275	7.99	2,286	5,733	CHECKED RN
04-Mar-11	08:10:00	271.08	1.25	16,800	6.81	2,469	204.83	1.33	16,997	6.81	2,498	4,966	START & STOP PUMPS OK
10-Mar-11	08:00:00	272.73	1.65	22,176	5.99	3,700	206.06	1.23	15,719	5.99	2,623	6,323	START & STOP PUMPS OK
15-Mar-11	11:00:00	274.15	1.42	19,085	5.13	3,724	207.15	1.09	13,930	5.13	2,718	6,442	START & STOP PUMPS OK
24-Mar-11	08:00:00	276.61	2.46	33,062	8.88	3,725	209.21	2.06	26,327	8.88	2,966	6,692	START & STOP PUMPS OK
01-Apr-11	11:30:00	278.46	1.85	24,864	8.00	3,108	210.46	1.25	15,975	8.00	1,997	5,105	OK
08-Apr-11	07:45:00	280.53	2.07	27,821	7.00	3,974	212.24	1.78	22,748	7.00	3,250	7,224	OK
14-Apr-11	10:15:00	282.50	1.97	26,477	6.00	4,413	213.46	1.22	15,592	6.00	2,599	7,011	OK
22-Apr-11	09:00:00	284.78	2.28	30,643	8.00	3,830	215.48	2.02	25,816	8.00	3,227	7,057	CHECK WET WELL STOP AND START OK
29-Apr-11		287.45	2.67	35,885	7.00	5,126	217.61	2.13	27,221	7.00	3,889	9,015	CHECK WET WELL STOP AND START OK
05-May-11	10:00:00	289.05	1.60	21,504	6.00	3,584	218.94	1.33	16,997	6.00	2,833	6,417	OK
12-May-11	11:00:00	290.89	1.84	24,730	7.00	3,533	220.64	1.70	21,726	7.00	3,104	6,637	OK
19-May-11	07:00:00	293.02	2.13	28,627	7.00	4,090	222.28	1.64	20,959	7.00	2,994	7,084	OK
26-May-11	08:00:00	295.69	2.67	35,885	7.00	5,126	224.19	1.91	24,410	7.00	3,487	8,614	OK
02-Jun-11	12:00:00	297.94	2.67	35,885	7.00	5,126	225.89	1.70	21,726	7.00	3,104	8,230	OK
10-Jun-11	07:30:00	300.12	2.25	30,240	8.00	3,780	228.32	2.43	31,055	8.00	3,882	7,662	OK
15-Jun-11	13:00:00	301.99	2.18	29,299	5.00	5,860	229.91	1.59	20,320	5.00	4,064	9,924	COULD NOT OPEN HATCH
23-Jun-11	12:30:00	304.76	1.87	25,133	8.00	3,142	231.76	1.85	23,643	8.00	2,955	6,097	OK
29-Jun-11	07:30:00	306.53	2.77	37,229	6.00	6,205	233.17	1.41	18,020	6.00	3,003	9,208	OK
07-Jul-11	15:30:00	310.18	1.77	23,789	8.00	2,974	235.76	2.59	33,100	8.00	4,138	7,111	OK
14-Jul-11	07:00:00	312.39	3.65	49,056	7.00	7,008	237.36	1.60	20,448	7.00	2,921	9,929	OK
22-Jul-11	07:00:00	315.02	2.21	29,702	8.00	3,713	240.04	2.68	34,250	8.00	4,281	7,994	OK
28-Jul-11	07:00:00	317.78	2.63	35,347	6.00	5,891	241.95	1.91	24,410	6.00	4,068	9,959	OK
03-Aug-11	07:00:00	320.24	2.76	37,094	6.00	6,182	243.72	1.77	22,621	6.00	3,770	9,953	OK
16-Aug-11	11:30:00	325.16	2.46	33,062	13.00	2,543	248.00	4.28	54,698	13.00	4,208	6,751	START AND STOP ALARM OK
23-Aug-11	10:00:00	328.40	4.92	66,125	7.00	9,446	249.98	1.98	25,304	7.00	3,615	13,061	OK
31-Aug-11	10:00:00	329.95	3.24	43,546	8.00	5,443	251.60	1.62	20,704	8.00	2,588	8,031	OK
08-Sep-11	07:00:00	332.14	1.55	20,832	8.00	2,604	253.37	1.77	22,621	8.00	2,828	5,432	OK
15-Sep-11	07:00:00	333.93	2.19	29,434	7.00	4,205	254.76	1.39	17,764	7.00	2,538	6,743	OK
21-Sep-11	08:00:00	335.62	1.79	24,058	6.00	4,010	256.03	1.27	16,231	6.00	2,705	6,715	OK
29-Sep-11	07:00:00	337.97	1.69	22,714	8.00	2,839	257.01	0.98	12,524	8.00	1,566	4,405	OK
06-Oct-11	07:00:00	339.86	2.35	31,584	7.00	4,512	259.48	2.47	31,567	7.00	4,510	9,022	OK
13-Oct-11	07:00:00	342.64	1.89	25,402	7.00	3,629	261.21	1.73	22,109	7.00	3,158	6,787	OK
27-Oct-11	09:00:00	346.47	2.78	37,363	14.00	2,669	264.46	3.25	41,535	14.00	2,967	5,636	OK
04-Nov-11	08:30:00	348.45	3.83	51,475	8.00	6,434	266.04	1.58	20,192	8.00	2,524	8,958	OK
07-Nov-11	14:00:00	349.84	1.98	26,611	3.00	8,870	267.00	0.96	12,269	3.00	4,090	12,960	OK
14-Nov-11	10:30:00	351.52	1.39	18,682	7.00	2,669	268.38	1.38	17,636	7.00	2,519	5,188	OK

PUMPING TEST FLOW RATES: (NOV 15, 2011)
PUMP #1: 224.0 L/min
PUMP #2: 213.0 L/min

PUMP 1
YEARLY AVERAGE DAILY FLOW: 4,285 L/d
MAX. DAILY FLOW RATE: 9,446 L/d

PUMP 2
YEARLY AVERAGE DAILY FLOW: 2,831 L/d
MAX. DAILY FLOW RATE: 4,510 L/d

COMBINED AVERAGE DAILY FLOW RATE: 7,116 L/d
COMBINED MAXIMUM DAILY FLOW,RATE: 13,061 L/d
ASSUMED ERRONEOUS READINGS EXCLUDED FROM CALCULATIONS

TABLE 2
LAB ANALYSIS RESULTS OF SEPTIC TANK EFFLUENT
LAKEWOOD SUBDIVISION SEWAGE SYSTEM
2010 ANNUAL INSPECTION REPORT

Date	BOD mg/L	Total Suspended Solids mg/L	pH pH units	Nitrate mg/L	Ammonia (N) Total mg/L	Total Kjeldahl Nitrogen mg/L	Phosphorus Total mg/L
May 30/03	155	76	7.38	0.2	58.8	75.8	10.7
Sept. 7/04	82	22	7.35	0.1	62.4	70.9	9.88
Sept. 19/05	53	44	7.41	<0.1	63.9	75.5	10.6
Sept. 22/06	93	90	7.47	0.1	63.4	74.6	9.65
Nov. 26/07	64	18	7.7	<0.1	59.1	67.4	9.49
Nov. 18/08	81	32	8.12	0.1	68.5	71.1	9.6
Nov. 24/09	62	44	N/A	<0.05	74.5	73.9	9.59
Oct. 19/10	74	23	7.77	<0.06	69.9	66.3	10.1
Nov. 15/11	74	10	7.85	<0.05	63.1	63.7	8.85
Typical Concentration Range for Septic Effluent	140 to 200	50 to 100				40 to 100	5 to 15

- Typical concentration range for septic tank effluent were obtained from the USEPA On-Site Wastewater Treatment Systems Manual
- Lab Analysis Conducted by Caduceon Environmental Laboratories Inc (2003-2008)
- Lab Analysis Conducted by SGS Lakefield Research (2009-2011)

N/A - sample parameter result not provided

Submitted by
OCWA
Nov. 15, 2011

LAKEWOOD SUBDIVISION

Sewage System 2011

1. Weekly inspections were conducted throughout the year usually on Thursdays. This includes visual inspections of equipment, wet well, and building, recording of pump hours, exercising of pumps. The alarm dialer is currently not working and will be operational within the month.
2. On 09 November 2011 annual inspections of the manholes was conducted. Excess water was removed and bowls were installed to prevent water running into the manholes.
3. We had an electrician on site to fix the constant tripping of the pumps. A breaker was replaced, the electrical panel was serviced and we have had little problem since.

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Project : PO#017018

Monday, November 28, 2011

OCWA-Southampton (Lakewood STP)
Attn : Dave Trombley

P.O. Box 760
Southampton, ON
N0H 2L0, Canada

Phone: 519-797-2561
Fax:pdf, 519-941-1794

Date Rec. : 18 November 2011
LR Report: CA14927-NOV11

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: Eff Eff-Effluent
Sample Date & Time					15-Nov-11 10:15
Temperature Upon Receipt [°C]	---	---	---	---	11.0
Biological Oxygen Demand (BOD5) [mg/L]	18-Nov-11	11:41	23-Nov-11	19:17	74
Total Suspended Solids [mg/L]	21-Nov-11	07:54	22-Nov-11	09:21	10
pH [no unit]	21-Nov-11	09:37	22-Nov-11	15:43	7.85
Phosphorus (total) [mg/L]	21-Nov-11	08:00	23-Nov-11	10:41	8.85
Total Kjeldahl Nitrogen [as N mg/L]	22-Nov-11	21:00	28-Nov-11	08:54	63.7
Ammonia+Ammonium (N) [mg/L]	19-Nov-11	06:39	23-Nov-11	08:44	63.1
Nitrite (as N) [mg/L]	20-Nov-11	12:19	26-Nov-11	07:56	< 0.06
Nitrate (as N) [mg/L]	20-Nov-11	12:19	26-Nov-11	07:56	< 0.05
Nitrate + Nitrite (as N) [mg/L]	20-Nov-11	12:19	26-Nov-11	07:56	< 0.06

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical

OnLine LIMS