

REPORT ON HEARING
NORQUAY HOLDING COMPANY
SEWAGE LAGOON

THE CLEAN ENVIRONMENT COMMISSION

DECEMBER 6, 1989

NORQUAY HOLDING CO.

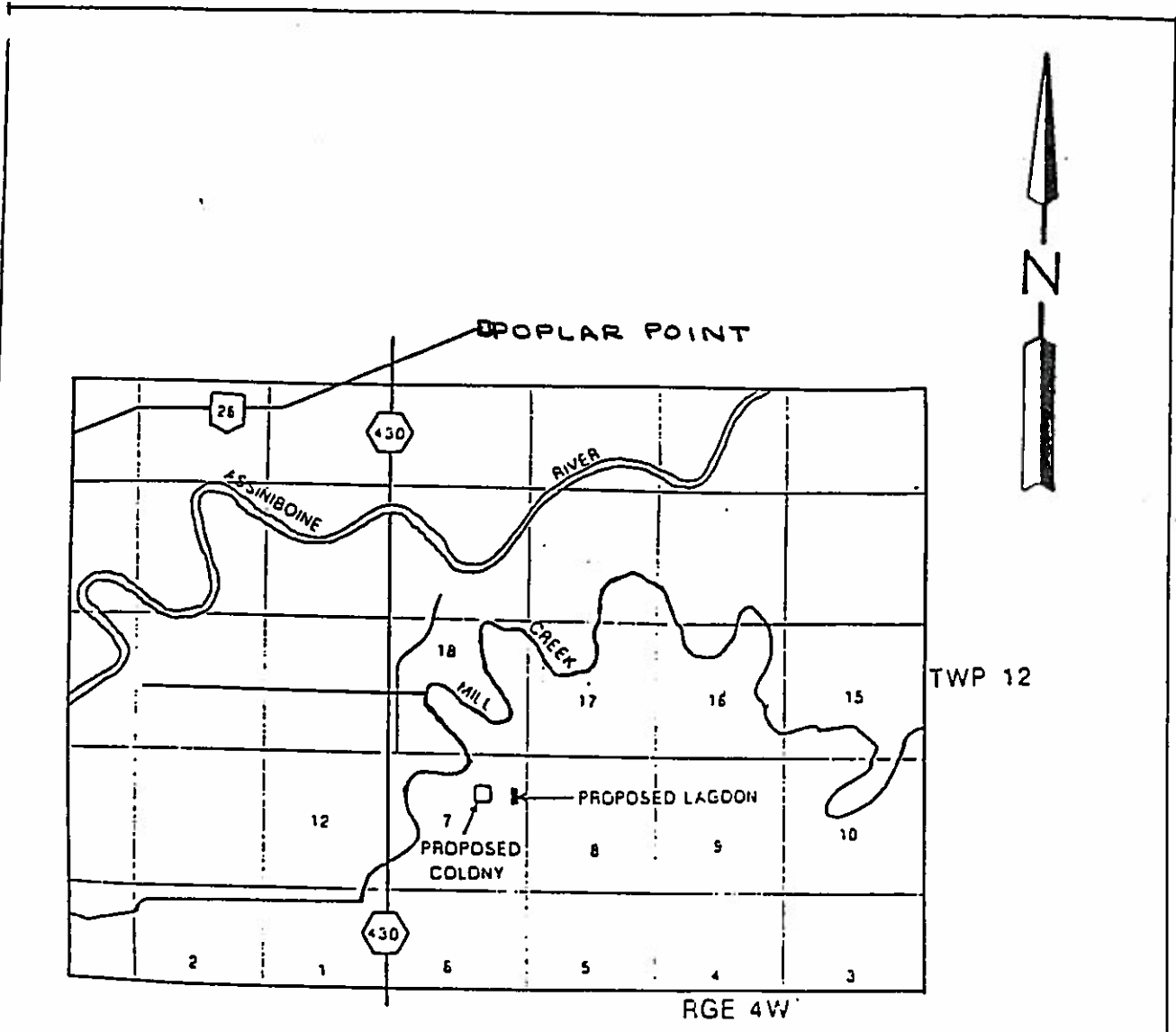
BACKGROUND

On August 9, 1989, A.J. Poetker of Poetker Engineering Consultants filed a proposal with the Environment Department on behalf of Norquay Holding Company for a licence under the Environment Act for a domestic wastewater lagoon for a new Hutterite Colony to be located on the NE 1/4 07-12-04 WPM (figure 1). The proposal was advertised by the Department on August 19, 1989 in the Winnipeg Free Press and August 22, 1989 in the Portage Herald Leader Press. Twenty-four people expressed concern about the proposal relating mainly to the impact on domestic well water supplies from contaminants from the proposed lagoon and land applied effluent and the potential for odors.

Based upon these expressions of concern, the Minister of Environment, the Honourable J. Glen Cummings in a letter dated September 21, 1989 requested that the Clean Environment Commission hold a public hearing on the matter and provide him with a report and recommendations. The Clean Environment Commission gave notice of the hearing on October 16, 1989 and the hearing was held on November 2, 1989 in Poplar Point, Manitoba.

PUBLIC PARTICIPATION AND HEARING

Approximately 35 people were in attendance at the hearing including the proponent, their consultant, representatives from the Manitoba Departments of Environment, Health and Natural Resources and concerned nearby residents. Commissioners in attendance were Mr. Stan Eagleton, Chairperson, Mr. Maurice Blanchard and Mr. Arnie Barr from Portage la Prairie, Manitoba.



LOCATION PLAN

FIGURE 1

POSITION OF PROPONENT

Mr. Alf Poetker, P. Eng. of Poetker Engineering Consultants made the presentation on behalf of the Milltown Colony (Norquay Holding Co.). He noted that the proposal was to construct a wastewater system for a new Hutterite Colony to be located at NE 1/4 7-12-4 WPM. At capacity, the colony would house 120 people. Construction was awaiting the Environment Act Licence although Mr. Waldner, the Secretary Treasurer of the Milltown Colony, at a later point in the hearing noted that a building permit had been obtained from the Rural Municipality of Portage la Prairie.

The housing for the Colony is proposed to be located on the west side of the property. Only domestic wastewater is to be handled by the sewage lagoons. A water supply for the facility will be obtained from a well located north of the site in a coarse granular soil, which is likely part of an old stream channel. Later testimony showed that all of the domestic water supplies in the area are obtained from similar stream meander channels. The lagoons are to be located on the west side of the property.

Mr. Poetker described of design considerations for the sewage lagoon. He noted that the soil at the site of the lagoon consisted of a silty sand to a depth of several metres. This material is underlain by a heavy plastic clay which is 10 to 20 metres in thickness. The clay is supported on glacial till which overlays the limestone bedrock. The bedrock aquifer is not used for domestic water supply purposes because of its salinity. In order to meet the design objectives for soil hydraulic conductivity for a sewage lagoon, a 1 metre wide cut-off trench backfilled with impervious clay would be keyed in to the clay berm of the peripheral dykes of the lagoon. The bottom of the clay barrier will be contiguous with the underlying impervious clay strata. The interior clay berm will also be a minimum 1 metre thick and composed of clay from the underlying formation.

The normal specification for the design of a primary cell of a sewage lagoon in Manitoba is 56 kilograms of biochemical oxygen demand (BOD) per hectare whereas this lagoon system has been designed for an organic loading

rate of only 35 kilograms per hectare. Odours associated with the spring break-up should not be a problem in the neighborhood for reasons of the reduced organic loading rate of the primary cell and a separation of 600 metres from the nearest residence (the objectives specify that a lagoon should not be closer than 300 metres to an individual residence). Sufficient storage has been provided as part of the primary cell and in a secondary cell to retain the effluent for 350 days.

It is expected that the quality of the effluent will exceed the discharge limits that are normally required if a receiving stream was to be employed for dilution of the effluent (i.e. biochemical oxygen demand of less than 30 mg/L and fecal coliforms with an MPN of less than 200 per 100 ml). The effluent is to be land applied to a 20 hectare plot owned by the colony. The precise discharge site was not identified by the proponent. An irrigation plot of that size would result in an application of 40 millimetres of effluent per year (this compares with an average precipitation of 400 millimetres in this area). It is expected that effluent will be withdrawn from the lagoon and applied to the land by means of an irrigation gun. The total nitrogen applied to the soil from the wastewater effluent is expected to be 0.3 kilograms per hectare as compared to agricultural applications which range from 60 to 90 kilograms per hectare. The consultant expected that the nutrients in the effluent would be taken up by the vegetation.

The proponent's consultant stated that the wastewater operation proposed is environmentally sound and that there is no possibility of contamination to the adjacent lands or the groundwater aquifers.

CITIZEN CONCERNS

A number of letters and petitions had been received from nearby residents. Approximately 20 residents were in attendance at the hearing.

The major concern expressed in both the correspondence and at the hearing was the potential impact from contaminants in the wastewater effluent

migrating from the lagoon or from land application of effluent into the shallow groundwater aquifers which service the farmsteads with a water supply. Mr. Gene Lacroix recommended that a plastic lined concrete tank be used in place of a clay lined lagoon with a series of observation wells to monitor seepage. Mrs. Pat Nicholls felt that the colony should be required to use septic tanks and disposal fields like all the other residents. Mr. Abe Peters wanted the irrigation plot for effluent disposal to be specifically identified to prevent indiscriminate discharge of the effluent. Mr. William Kuzyk recommended that the effluent should be injected into the soil rather than applied on to the soil surface. The Consultant re-iterated that the system wastewater treatment system proposed would not result in the contamination of groundwater.

A second concern of the neighbors was the possibility of odours being produced from the system. The consultant had noted that the odours were expected to be confined to a short period during spring break-up and that they would be negligible. In response to a question concerning the specific location of an irrigation tract for effluent disposal, the proponent referred to a 120 hectare field across the road from the lagoon. He noted that any site on this field would be more than 450 metres from another residence.

Mr. Kuzyk and Mr. Peters identified a concern about the proliferation of Hutterite Colonies in the Rural Municipality of Portage and their impact on the fabric of the local society. In their view a colony is similar to a community which disrupts other communities in the area.

POSITION OF THE R.M. OF PORTAGE LA PRAIRIE

Councillor Harold Brown spoke on behalf of the Rural Municipality of Portage la Prairie. He addressed the question of the objectives and policies of the Rural Municipality Development Plan and zoning By-Law as they pertain to agricultural activities. He noted that based on the parameters of the Rural Municipality Development Plan and By-law, the land in question is zoned agriculture and that the colony is a large farm operation. Therefore, the

basic concern of the Rural Municipality is to ensure that the environment is protected. On this basis council of the Rural Municipality wanted assurances that the proposed wastewater treatment lagoon would not affect the area residents.

POSITION OF THE PROVINCIAL GOVERNMENT DEPARTMENTS

(a) Environmental Health Services

The position of Dr. N.S. Rihal speaking on behalf of the Department of Health was that public health problems would not be anticipated since the design and operational guidelines of the Environment Department were to be followed and effluent would be disposed on to colony land.

(b) Water Resources Branch

Mr. M. Rutulis, hydrogeologist with the Water Resources Branch described the hydro-geological setting in the area. He noted that domestic water supplies are located in the coarse sands of the meander belts. These meander belts are former stream channels. Away from these streambeds, the soils are a sandy silty clay in which there is insufficient water for a domestic well. In order to protect water supplies in the area, pollutants should not be deposited in the meander belts. In Mr. Rutulis's view, the flow through the clay barrier of the lagoon as proposed would be insignificant and therefore the design of the lagoon is suitable and acceptable in protecting the groundwater in the area.

(c) Environmental Control Branch

The Environment Department was represented by Mr. M. Van Den Bosch, an Environmental Officer with the Branch. He noted that the colony proposal had been submitted to the Technical Advisory Committee consisting of representatives from a number of government departments who have an interest in such matters. None of the respondents expressed concerns about the proposal. He recommended a number of clauses that should be considered for licencing purposes such as:

1. Limiting the organic and hydraulic loading of the wastewater treatment lagoon.
2. Limiting the type of wastewater to be treated.
3. Requiring the treatment of all domestic sewage in the wastewater treatment facility.
4. Specifying the soil structure requirements for wastewater lagoons.
5. Specifying the construction and sampling requirements to insure soil structure requirements are met.
6. Specifying procedures to be followed if the sewage collection or treatment system breaks down.
7. Specifying effluent irrigation requirements, including crop restrictions and application procedures.
8. Specifying limitations on public access.

He also noted that there should be some reference to a salinity limitation on the effluent since the colony will be employing some water softening and salt will be introduced into the wastewater collection system. The volume of salt, however, should not prohibit the use of the wastewater for irrigation.

DISCUSSION AND CONCLUSIONS

The major concerns identified by the neighboring residents, with respect to the construction of the sewage lagoon, related to the contamination of the local groundwater which is the source of the domestic water supplies and the odours.

The Commission is satisfied that odours will not be a problem since the primary cell of the sewage lagoon will be receiving a smaller organic load than the current "Design Objectives for Sewage Lagoons in Manitoba" and also because the lagoon will be located more than 300 metres from the nearest dwelling which is considered to be the normal pre-requisite for lagoons. Spray irrigation of the effluent should produce little odour beyond the boundaries of the irrigation plot.

Hydrogeologically, the Commission was told at the hearing that the clay barrier proposed to line the sewage lagoon cells would prevent the effluent from reaching the stream meanders which make up the aquifers for the local water supplies.

The Environment Department representative proposed a number of clauses that should be incorporated into an Environment Licence to ensure that the wastewater system should operate without environmental detriment.

A number of citizens asked for some assurance that the sewage lagoon and effluent land application program would not impact the neighbors through odours or contaminate the domestic water supply aquifers. They wished to know what actions might be taken on their behalf to protect them or provide

mitigation to their situation if the predicted result of the operation did not occur and they were, in fact, adversely impacted by the proposed operation. The response from the representative of the Department could have been simplified by indicating that the clauses of an Environment Licence and the enforcement of that document by the Environment Department are designed to protect the individual and the environment. The discussion that took place about an individual's recourse to civil law in such a case seemed inappropriate in this setting. The Commissioner believes that more assurance of some effective remedial action should have been conveyed by the Department representative.

The Commission concludes that the sewage lagoon proposed can be constructed and operated satisfactorily if the limits, terms and conditions as recommended are followed.

RECOMMENDATIONS

1. The Applicant shall ensure that all domestic wastewater generated within the Colony is directed towards the wastewater treatment lagoon.
2. The Applicant shall ensure that no livestock waste is directed toward the wastewater treatment lagoon.
3. The Applicant shall not discharge effluent from the wastewater treatment lagoon:
 - (a) where the organic content of the effluent, as indicated by the five day biochemical oxygen demand, is in excess of 30 milligrams per litre;
 - (b) where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample;

- (c) where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample;
 - (d) between the first day of October of any year and the 15th day of May of the following year, unless prior approval by the Director, is given.
4. The Applicant shall not discharge effluent from the primary cell of the wastewater treatment lagoon, except to the secondary cell of the said lagoon.
5. The Applicant shall operate and maintain the wastewater treatment lagoon in such a manner that:
- (a) the release of offensive odours is minimized;
 - (b) the organic loading on the primary cell of the lagoon system, as indicated by the five day biochemical oxygen demand, is not in excess of 56 kilograms per hectare per day;
 - (c) the depth of sewage in the primary cell does not exceed 1.5 metres.
6. The Applicant shall discharge effluent from the wastewater treatment lagoon only onto lands owned by the Applicant.
7. The Applicant shall not discharge effluent:
- (a) within 300 metres of any dwelling not owned or lawfully controlled by the Applicant.
 - (b) within 60 metres of any surface watercourse or groundwater well; and

(c) within 20 metres of any property boundary.

8. The Applicant shall ensure that all treated effluent is disposed of by spray irrigation onto land owned by the Applicant and that:

(a) effluent is only discharged to irrigate:

(i) actively growing forage crops;

(ii) grasslands which will not be utilized for grazing:

A. by dairy cattle for at least 30 days after effluent is applied;

B. by livestock other than dairy cattle for at least 7 days after effluent is applied;

(iii) forage crops where irrigation does not take place during or for at least 7 days prior to harvesting of the crops;

(b) during 10 continuous hours in every 24-hour period, no application of effluent takes place; and

(c) no surface ponding or surface runoff occurs during irrigation.

9. The Applicant shall submit samples of the lagoon effluent for conductivity and sodium adsorption ratio analyses to the Director prior to each annual irrigation season.

10. The Applicant shall, in case of physical or mechanical breakdown of the wastewater collection and/or treatment system:
 - (a) notify the Director immediately;
 - (b) identify the repairs to the wastewater collection and/or treatment system;
 - (c) complete the repairs in accordance with the written instructions of the Director.

11. The Applicant shall prior to the construction of dykes for the wastewater treatment lagoon:
 - (a) remove all organic topsoil from the area where the dykes will be constructed; or,
 - (b) remove all organic material for a depth of 0.3 metres and a width of 3.0 metres from the area where the dyke will be built, providing all the lagoon dykes are lined with clay or other suitable material as required by Clause 12 to a minimum thickness of one metre measured perpendicular to the face of the side wall.

12. The Applicant shall construct the wastewater treatment lagoon with clay or other suitable material such that all interior surfaces of the lagoon structure are underlain with a minimum of 1 metre of soil having a hydraulic conductivity of 1×10^{-7} centimetres per second or less.

13. The Applicant shall arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15th day of May and the 1st day of November of any year, unless prior approval, by the Director, is given.

14. The Applicant shall either:
 - (a) subject undisturbed soil samples from the completed wastewater treatment lagoon to hydraulic conductivity tests, the number and location of said samples to be specified by the designated Environment Officer up to a maximum of twenty samples; or,
 - (b) where undisturbed soil samples cannot be taken, test the soil of 4 plane surfaces of the wastewater treatment lagoon for hydraulic conductivity by an insitu field test method as prescribed by the designated Environment Officer.
15. The Applicant shall, not less than 2 weeks before the wastewater treatment lagoon is placed in operation, submit to the Director the results of the tests carried out pursuant to Clause 14.
16. The Applicant shall install a fence around the wastewater treatment lagoon to limit access.