SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPONENT:	**Springfield Holding Co. Ltd.: Applicant**
PROPOSAL NAME:	**Springfield Colony Wastewater Treatment Lagoon**
CLASS OF DEVELOPMENT:	**2**
TYPE OF DEVELOPMENT:	**Wastewater Treatment Lagoon**
CLIENT FILE NO.:	**982.20**

OVERVIEW:

On January 27, 1999, the Department received a Proposal from Springfield Holding Co. Ltd. to alter the development of the wastewater treatment lagoon as previously licenced. Licence No. 1738 was issued in 1994 for the original development which included disposal of effluent by irrigation on land owned by the Licencee. The alteration proposed is for an optional effluent discharge to Hazel Creek which drains into the Brokenhead River. The wastewater treatment lagoon is located on the northeast quarter of Section 14, Township 11, Range 8 EPM. A copy is attached for reference.

The Department, on March 4, 1999, placed copies of the Proposal in the Public Registries located at 123 Main St. (Union Station); the Centennial Public Library, the Brokenhead River Regional Library and provided copies of the Proposal to the Interdepartmental Planning Board and TAC members. As well, the Department placed a public notification of the Proposal in the Brokenhead River Review on March 9, 1999. The newspaper and TAC notification invited responses until April 3, 1999.

COMMENTS FROM THE PUBLIC:

- *One response was received to the public notification. Mr. Hugh Arklie raised the following concerns:*
  - *The proposal does not address why this is necessary so soon after the 1994 project. Was the earlier analysis deficient? What plans and assumptions of 1994 failed to materialize? What new circumstances give rise to this new Proposal.*
  - *The new proposal wants an option to discharge to a creek "when the land application is not practical". The only elaboration offered anywhere in the Proposal is on page 6 in a single reference to when "irrigation is not required". This is obviously not a rigorous analysis of "not practical". It is clearly subjective and open to abuse of the potential licence. How will Manitoba Environment monitor the situation?*
  - *The 1994 "system was designed to serve a maximum of 120 people". What is the current population?*

- *It has been estimated in the proposal that the Springfield Colony uses 180 litres of wastewater per person per day. How does this compare to Canadian averages?*
- *On page 7 of the proposal the last 2 paragraphs clearly state that the Colony's wastewater can be readily accommodated on its land and that this is the most desirable environmental option from an environmental standpoint.*
- *The proposal fails to comment on the impacts on wildlife and fisheries. Comments were expected on the impact on amphibians, shoreline birds, ducks, muskrats and fish in Hazel Creek and the Brokenhead River.*
- *The "Description of the Development" also requires the proponent to produce a "schedule" which deals with proposed dates of construction and operation. The proposal indicates that the wastewater stabilization pond was constructed in 1994. This is a new proposal. What dates are critical to this proposal?*

- *In summary, Mr. Arklie states the proposal should be rejected.*

The proponent provided the following responses to the questions/concerns:

- *Nothing went wrong with the 1994 project. The Colony wishes to discharge its lagoon effluent to Hazel Creek instead of to agricultural land as approved in the 1994 proposal. The reason is that the Colony at the present moment wants to get rid of their crops (alfalfa, etc.) from the land. Since they will not need irrigation water any more, the effluent has then to be discharged into a surface water, in this case Hazel Creek. Manitoba Environment assumed this change as "a major alteration" therefore a new proposal had to be submitted. There will be no changes with the lagoon itself as it has already been constructed in 1994. The only change is the discharge operation.*
- *When the Colony obtains the proposed licence to discharge to Hazel Creek, determination of when land application is not practical will not be an issue. The Colony will still have the option to discharge to agricultural land. They can use both options alternatively as long as they follow the discharging procedure as described in the licence.*
- *The most recent population count is 112 people.*
- *According to "Wastewater Engineering, Treatment, Disposal, and Reuse" by Metcalf and Eddy (3rd Edition, 1991), typical domestic wastewater flow rates range from 150 to 490 litres per capita per day. The proposal used 180 litres per capita per day, which is very typical for Colonies based on water usage.*
- *The last paragraph of page 7 says: "Taking into account the high quality of the effluent, and availability of the <u>land</u>, the proposed wastewater stabilization pond is the most desirable option from an environmental standpoint, and from the standpoint of the colony's interest". In this sentence, "land" does not mean agricultural land, but the available space where the pond can be built. The discharge can be made both on the agricultural land or surface water. The*

capability of the creek to receive the discharge has been explained on page 9 of the proposal.

- *It is important to note that the stabilization pond does not function only as a storage facility. Bio-chemical reactions actually occur in it. These reactions stabilize organics, ammonia, nitrogen, phosphorus and other constituents in the water. Its performance is actually better than that of mechanical treatment units. The stabilization pond is able to handle shock loading and produces a more consistent effluent quality due to its huge storage capacity. The impact on animals will be minimal as long as the quality of the discharge meets the provincial guidelines.*
- *The pond was constructed in 1994; therefore there is no new schedule to be set.*

Disposition:

- The proponent has provided responses to the questions/comments raised.
- The draft Licence includes restrictions on discharge periods and effluent monitoring requirements that will protect aquatic life. The discharge will contribute additional nutrient load to the receiving water and may have a cumulative effect with other sources of nutrients. The draft Licence includes a clause respecting participation in a nutrient reduction program.
- The reduced need for irrigation water does not fully explain why the surface water discharge option has been requested. Basic requirements for all effluent irrigation projects are a land base and a crop to irrigate.
- The proposal indicates that the SAR is 11 and the Manitoba Water Quality Objective for Class 4 Agricultural Consumption (Category C) is 8.0. In 1993, the proponent had indicated in the previous proposal that the SAR of the wastewater was 4. High SAR values, in wastewater, occur when ion exchange water softening is used for treating a water supply.
- Based on experience with other effluent irrigation projects, I believe that there may be an impact to the irrigation land and that the impact may have resulted in the surface water discharge option being requested.
- Changing the water softening process or reducing the amount of softening salts used, would reduce the SAR value and the resulting impact of the land.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Highways

- *No comment.*

Natural Resources

- *It is suggested that in the proposal that at certain times the effluent may be drained into Hazel Creek which flows into the Brokenhead River. The Brokenhead River is an important fish bearing stream in this area. The timing and frequency of effluent emissions and their potential impact on fish habitat in the Brokenhead River should be more fully assessed..*

The proponent provided the following response:

- *Each year, two discharges are made: one in the middle of June (after June 15) and the other at the end of October (before October 31). Each discharge takes about 37 hours. The maximum discharge of the pond is 19 L/s (=0.019 m^3/s) which is less than the 60 L/s assumed in the proposal. This flow can be assumed as the characteristic flow of the pond discharge.*
- *The Brokenhead River monthly flow data are as follows (Environment Canada):*

	1996	*1997*	*1998*
Maximum flow (m^3/s)	*76.3*	*83.3*	*54.2*

Mean flow (m^3/s)	*6.2*	*11.7*	*8.2*
Minimum flow (m^3/s)	*0.09*	*0.09*	*0.09*

Since the 7Q10 (10% of lowest flow in 7 days) data are not available, the average mean flow (8.7 m^3/s) can be assumed as the characteristic flow of the river.

The estimated maximum pond final effluent quality, the river water quality when the pond is not operating (Manitoba Environment 1973 to 1996 data) and the estimated river water quality when the pond is operating can be seen below.

	Pond Effluent	*River Water*	*Combined Water*
BOD_5 (mg/l)	*30*	*2.10*	*2.16*
Ammonia (mg/l)	*15*	*0.29*	*0.32*
TKN (mg/l)	*30*	*1.27*	*1.33*
TP (mg/l)	*5*	*0.07*	*0.08*

The above table shows that the pond discharge does not have significant impacts on the river water quality. It is important to note that the discharge only takes about 37 hours. This means that the pond effluent will be further diluted with more water after the discharge is completed. Even under the minimum river flow condition (0.09 m^3/s), the impact will still be minimum.

Disposition:

- The draft Licence includes restrictions on discharge periods and effluent monitoring requirements that will protect aquatic life. The discharge will contribute additional nutrient load to the receiving water and may have a cumulative effect with other sources of nutrients. The draft Licence includes a clause respecting participation in a nutrient reduction program.

Historic Resources

- *No concerns.*

Rural Development

- *No concerns.*

Health

- *No comment.*

Environment-Operations Division

- *One potential item that was not addressed by concerned individuals or other Departments is do the Colonies in general soften their water and if so what is the salt quality of the lagoon effluent and its impact on agricultural land or the receiving stream. If SAR is a problem that may be why this colony and perhaps others may want to switch to water discharge. The same situation as Oakbank may exit, with salt impacting agricultural land.*

Disposition:

- The reduced need for irrigation water does not fully explain why the surface water discharge option has been requested. Basic requirements for all effluent irrigation projects are a land base and a crop to irrigate.
- I believe that the proposal does address the salinity issue by reference to SAR and its constituent ions in Section 8.3. The reference indicates that the SAR is 11 and the Manitoba Water Quality Objective for Class 4 Agricultural Consumption (Category C) is 8.0. In 1993, the proponent had indicated in the previous proposal that the SAR was 4. High SAR values, in wastewater, occur when ion exchange water softening is used for treating a water supply.
- Based on experience with other effluent irrigation projects, I believe that there may be an impact to the irrigation land and that the impact may have resulted in the surface water discharge option being requested.
- Changing the water softening process or reducing the amount of softening salts used, would reduce the SAR value and the resulting impact of the land.

Environment-Water Quality Management

- *The colony has requested an option to discharge to Hazel Creek during times when land irrigation is not necessary. The colony made a similar request in the original Environment Act Proposal of June 1993, but later withdrew the surface water discharge option and agreed to only discharge effluent via land application.*
- *The present proposal does not provide any details as to what conditions or circumstances would warrant switching from land application to surface water discharge. As well, both the 1993 proposal and the present proposal states that "the surface soils are expected to readily accommodate the volume of effluent to be discharged to it on an annual basis (Section 7 of both proposals)*
- *Given that land application is the environmentally preferred method of effluent disposal for operations such as this, and the fact that the proponents have not provided any concrete reasons for changing the present practice, I think the proponents should be encouraged to comply with the original licence requirements.*

The proponent provided the following response:

- *At present, the Colony has changed the crop practices such that they will not need irrigation water any more. Therefore, they wish to discharge the effluent into a local slough which drains into Hazel Creek.*

Disposition:

- The reduced need for irrigation water does not fully explain why the surface water discharge option has been requested. Basic requirements for all effluent irrigation

projects are a land base and a crop to irrigate. Therefore the proponent has chosen to not use effluent irrigation as a means of disposal.

- High SAR values, in wastewater, occur when ion exchange water softening is used for treating a water supply. Based on experience with other effluent irrigation projects, I believe that there may be an impact to the irrigation land and that the impact may have resulted in the surface water discharge option being requested. At this time, no impacts to the receiving water or to adjoining agricultural lands, have been identified as a result of the increased salinity.
- The discharge will contribute additional nutrient load to the receiving water and may have a cumulative effect with other sources of nutrients. The draft Licence includes a clause respecting participation in a nutrient reduction program.

Canadian Environmental Assessment Agency

- *The application of the Canadian Environmental Assessment Act with respect to this proposal will not be required.*

PUBLIC HEARING:

A public hearing is not required.

RECOMMENDATION:

A Licence should be issued in accordance with the attached draft. Enforcement of the Licence should be assigned to the Winnipeg Region.

Attachment: copy of Environment Act Licence No. 1738.

PREPARED BY:

Mike Van Den Bosch, P. Eng.
Environmental Engineer
Municipal & Industrial Approvals
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Telephone: (204) 945-7015
Fax: (204) 945-5229
E-mail Address: mvandenbos@gov.mb.ca