

**REPORT ON HEARING
R.M. OF RHINELAND/TOWN OF ALTONA
LIQUID WASTE HOLDING PONDS FOR
C.S.P. FOODS LTD.**

THE CLEAN ENVIRONMENT COMMISSION

SEPTEMBER 12, 1989

**RURAL MUNICIPALITY OF RHINELAND/TOWN OF ALTONA
LIQUID WASTE HOLDING PONDS FOR C.S.P. FOODS LTD.**

TABLE OF CONTENTS

	<u>PAGE</u>
BACKGROUND	1
HEARING	2
Presentation of the Proposal	2
A. The Rural Municipality of Rhineland/Town of Altona	2
Reeve Jake Schroeder	
Councillor Dennis Friesen	2
B. C.S.P. Foods Ltd.	3
Mr. Norm Buhr	3
Alternatives	5
Other Alternatives	7
Other Company Waste Disposal	8
The Concerns of Neighbouring Residential Farmers	8
The Environment Department	10
Mr. Adrian Jackson	10
Mr. Clem Moche	10
DISCUSSION AND CONCLUSIONS	12
RECOMMENDATIONS	15

RURAL MUNICIPALITY OF RHINELAND/TOWN OF ALTONA
LIQUID WASTE HOLDING PONDS FOR C.S.P. FOODS LTD.

BACKGROUND

On September 21, 1987, the Rural Municipality of Rhineland and the Town of Altona jointly registered a proposal with the Environment Department under the Clean Environment Act for the continued operation of holding ponds utilized for the discharge of liquid waste soap stock from the CSP Foods Ltd. oilseed processing plant located in Altona. The holding ponds are located a short distance beyond the limits of the Town of Altona in the Rural Municipality of Rhineland on Lot 2, Plan 2137, PT SE 1/2, 27-2-1 W.P.M. adjacent to the sanitary landfill site which serves both the Town and the Rural Municipality. The holding ponds are used only to receive soap stock waste from C.S.P. Foods Ltd.

Periodic liquid discharge from the holding ponds, when required, has been to a municipal drain leading to the Provincial Buffalo drain which empties into the Red River, a distance of an estimated 12 - 15 miles to the east. In the past, wastes discharged from CSP Foods Ltd. were evidently considered part of the normal operation of the adjacent landfill site and no order specific to this operation was issued.

In January, 1989, the Environment Department advertised its consideration of the licensing of this operation under the new Environment Act.

A number of expressions of concern or objection were received from local citizens and on March 3, 1989 the then Environment Minister, the Honourable Ed Connery, requested the Clean Environment Commission to convene a public hearing to consider the proposal and concerns and, following the hearing, to provide a report pursuant to Section 7(3) of The Environment Act. It was suggested that it might be beneficial to wait until late spring or early summer for the hearing in order to provide better opportunity to view the holding pond operation and that of the adjacent waste disposal ground.

After giving due notice and advertising in appropriate newspapers, the Commission convened a hearing in the Rhineland Pioneer Centre, Altona at 10:30 a.m., June 14, 1989. Commissioners in attendance were Mr. Stan Eagleton, Chairperson; Ms. Linda Ericsson, Ms. Elizabeth Pawlicki and Mr. Len Flett.

HEARING

Presentation of the Proposal

A. The Rural Municipality of Rhineland and the Town of Altona

Reeve Jake Schroeder of the Rural Municipality introduced the proposal on behalf of the Rural Municipality and the Town before turning the main presentation over to C.S.P. Foods Ltd.

Mr. Schroeder stated that a conditional use hearing on the waste disposal facilities had been held by Council in the recent past without objections being received; however, opposition surfaced last fall when the Rural Municipality and the Town proposed the purchase of an additional 25 acres of land for future expansion of the waste disposal facilities. The Reeve identified smoke from the burning of waste as being the major objection. He stated that a commitment for fencing of the facility was a condition imposed in the permit for the facility issued by the Rural Municipality and also that a commitment had been made to improve the municipal drainage system surrounding the waste facilities to the satisfaction of neighboring residents.

In later evidence presented, Town Councillor Dennis Friesen confirmed that assurance had been given to neighboring residents at the meeting last fall that drainage ditches would be constructed around the whole of the nuisance ground, not only around the holding ponds. He stated that the Town Engineer was presently working on the design of the ditches and that they would certainly be constructed in the fall of 1989. The proposed ditches were

not intended to accommodate overflow from the holding pond cells but to improve and regulate the drainage surrounding the site.

B. C.S.P. Foods Ltd.

Mr. Norm Buhr, Location General Manager at the Altona plant presented details of the operation of the plant, including the production of plant waste, and the operation of the soap stock holding ponds.

C.S.P. Foods oilseeds processing plant has been in existence in Altona since 1943. Canola, sunflower, seeds, and soybeans are crushed and processed in the Altona processing plant.

Originally the plant was essentially a crushing operation producing crude oil but in 1950 a refinery was built to further process crude oil into fully refined oils. The initial crushing plant operated at a capacity of 20 tonnes per day which has been continually increased to a current crushing capacity level of 800 tonnes per day. All of the crude oils produced by the crushing operation are not refined in the plant; however, more of the crude production is being refined every year and the plant is capable of refining all of the crude oil produced, if the market conditions require this. The growth and future of the Altona plant depend on the Company's response toward development of the market.

The present refining process produces a byproduct called soap stock resulting from the neutralization of free fatty acids by the addition of sodium hydroxide to the crude oils. When this mixture is heated a soap is formed which is then centrifuged to separate the refined oil and the soap stock. The soap stock essentially consists of neutralized free fatty acids, some gums, residual sodium hydroxide, and water. These fatty acids present a disposal problem, but they have significant value as animal feed; therefore, five years ago the Company commenced adding this material to their animal feed byproduct of the oil production. Today, approximately 50 percent of the fatty

acids produced are added back into the animal feed byproduct but the remaining 50 percent is hauled by tank truck to the municipal disposal site and dumped into the holding ponds which are utilized exclusively by C.S.P. Foods Ltd. for this purpose. Dumping into the first two holding pond cells began about 1976. Additional cells have been added since until now there are a total of six cells in operation, the newest and largest of which was only recently constructed and was not yet in operation. At the time of the hearing it had not yet been fenced.

The soap stock contains 40 to 50 percent water which tends to separate from the soap stock. The stratification, which takes place in the holding ponds, separates into water at the lower level and soap stock floating on top. The original two small cells are used as the primary cells into which the soap stock waste and water mixture from the plant is dumped. When the original soap stock mixture has settled in the primary receiving cells, the liquid beneath the soap stock including accumulated rainfall is decanted into other holding pond cells resulting in a progressively more pure water quality.

Finally, in the past, liquid has had to be discharged up to twice yearly (spring and fall) to the municipal drainage system leading to the Buffalo Drain and hence to the Red River - an estimated 35 miles away, following the drainage route, or 12 to 15 miles as the crow flies. Discharges have been in the order of 500,000 gallons, accomplished over a period of several days so that actual flow in the municipal drain has not been heavy. In Mr. Buhr's estimation, in normal weather years, the discharged effluent was absorbed into the ground in the drain within approximately a half mile from the discharge point.

The plant operation is such that an average of 60 to 70 tank truck loads per month of approx. 1,100 U.S. gallons each are hauled to the holding ponds. A continuous daily hauling of the soap stock waste and disposal into the holding ponds is necessary. With the present plant operation, the plant would have to shut down within 12 to 24 hours if soap stock could not be disposed of in the foregoing manner.

In the past, in order to keep up with the need to dispose of the soap stock byproduct, the Company has burned soap stock — as required on an intermittment basis — right in the holding ponds, which are adjacent to the sanitary landfill garbage disposal site where burning of other Town and Rural Municipality solid waste also takes place on a regular basis. When undertaken, the burning of the soap stock may last up to a week in duration.

Because of dry weather, and evaporation capability from the additional cells (evaporation can not affectively occur from the cells that have a layer of soap stock on top), there has not been a liquid discharge for the past year. Burning has not been done in the holding ponds for two years.

With the new large cell coming into operation, it is the Company's intention that future burning in the cells will not be necessary. With the increased utilization of soap stock for animal feed and with larger cell capacity for water evaporation, the Company believes that future discharge of liquid from the cells may also not be required. But this is not certain and if future discharges are to be eliminated, it is possible that future cell construction may be necessary. The additional land purchased by the Town and Rural Municipality at the holding pond site would allow for considerable future expansion of the holding pond complex.

Although Mr. Buhr did not comtemplate future burning of soap stock in the holding ponds, the best hope for no further necessity to discharge liquid, without further holding pond expansion, seemed to lie in possible operating alternatives which he outlined.

Alternatives

1. Increased addition of soap stock to the animal feed byproduct of the plant, beyond the approx. 50 percent now utilized in this manner. This would appear to depend to a considerable degree on the development of

new special markets, as animal feed trading rules presently restrict fat content in animal meal to 4 percent and this restriction has limited the current utilization level to 50 percent of soap stock production. Specialty markets, developed on an individual basis to meet specific needs of higher fat content, have been difficult to establish, partly because of significant variation in refinery production over the years.

2. Raw and acidulated soap stock may be used directly in the manufacture of soap as well as distilled and hydrogenated fatty acid from soap stock. Soybean and cottonseed soap stocks are used to make medium grade soaps for industrial purposes but not in toilet soap because of their level of unsaturation and high pigmentation. Canola soap stock has a very high level of chlorophyll and pigmentation. The necessity to transport the soap stock to a soap manufacturing market area is an added disadvantage particularly as the soap stock contains up to 5 percent water.
3. Acidulation of the soap stock is another possibility, although this process is presently used primarily with animal-type feed stock oil. Additional processes would be required. The soap stock mixture would have to react with an acid treatment - usually sulphuric acid. As a second step, the acidified oil would have to be separated from the acidic water which would then have to be neutralized. New and costly acid resistant equipment would be required. The acidic water would then have to be treated to neutralize it before discharge to a sewer system and this process would produce a sludge which in turn would have to be disposed of by landfill.
4. Physical refining is a relatively new process involving the distillation of the free fatty acids rather than neutralizing them with

a caustic. This process does not produce a soap stock. Although this method is practised on some oils, presently this process has not been developed to the point where it results in the production of an acceptable quality product for all oils, including canola. Progress has been made in the application of this process to sunflower oil and indications are that this oil it can be refined successfully by the physical refining method.

Other Alternatives

In response to questions, Mr. Buhr — and later Environment Department representative Mr. Clem Moche — advised that spreading and incorporating the soap stock on agricultural land was not a practical or beneficial method of disposing of the soap stock and that this material was likewise not suitable for disposal in a landfill site. The possibility of spontaneous combustion was a detrimental factor.

Mr. Buhr explained that the Company had been experimenting with methods of treating the soap stock/water in the holding ponds to result in an improved water quality before discharge from the ponds into the drainage system. Bacteria had been added to one cell and this treatment showed some promise in reducing the B.O.D. and other undesirable constituents of the discharge effluent. Further treatment techniques would be tried.

In summary, Mr. Buhr indicated that the Company was exploring alternatives to possibly reduce or eliminate the need to dispose of soap stock in the holding ponds. The most promising possibilities for such reduction seemed to be the development of additional markets for animal feed with more fat content and the physical refining of the fatty acids, which might prove to be more practical in the future. In the meantime the newly constructed cell would provide additional storage capacity as well as additional evaporative capacity for holding pond water not covered with soap stock. He did not

contemplate the necessity for further burning of soap stock in the holding ponds. If the alternatives under consideration did not work out in time, then further expansion of the holding ponds might be necessary.

Other Company Waste Disposal

As a result of questions during the hearing, the disposal into the municipal landfill of another byproduct of the Company's operations, came under review.

As a part of the oil refinery process, the oil is filtered through bleaching clay. Approximately 4 tonnes of oil-soaked clay must be disposed of daily and this is trucked to the landfill site, adjacent to the holding ponds, where it is either burned separately or added to municipal garbage to assist in the regular burning of that waste. The bleaching clay contains up to 35 percent oil which the Company would like to recover; however, while research is being done, no practical method of recovery has yet evolved, and refiners throughout the North American continent were said to dispose of this material by burning at landfill sites. Landfilling without burning is evidently not desirable as spontaneous combustion could occur. (Note: The Commission also believes that leaching of the oil could pose a possible source of groundwater contamination). Mr. Buhr testified that approximately 3 to 4 tonnes of bleaching clay must be disposed of per day in the foregoing manner.

The Town and Municipality have accepted this material at their landfill disposal site where it is either burned independently or mixed with other garbage waste burned at the landfill site.

The Concerns of Neighbouring Residential Farmers

In addition to the written concerns and objections which had been

received by the Environment Department and forwarded to the Commission for consideration, four farmers who lived and farmed on property in close proximity to the holding ponds and municipal landfill disposal site, made verbal representations to the Commission.

These farmers were Mr. Art Proese, Mr. Henry Heppner, Mr. Ed Klassen, and Mr. Don Klassen, all of whom lived or farmed within a mile of the holding pond - landfill disposal site. All had similar concerns about and objections to operations conducted at the holding pond and landfill site.

A major concern of the neighbouring farmers was the possible contamination of groundwater or surface water, either from leakage of the holding ponds or by overflow of the holding pond cells, which was reported by the farmers to have occurred at times in the past. This overflow caused problems to the adjacent farm land. It was also noted that after discharge of liquid effluent to the drainage ditches, nothing grew in the ditches for some time. These farmers had a number of dugouts within a mile of the holding pond - landfill site and possible contamination of these was a serious concern.

Another long standing objection was to the smoke from burning at both the holding ponds and the landfill site. Burning at the landfill site was stated to occur 24 hours a day and the smoke from this burning had a very detrimental effect on the quality of life of nearby residents.

A third serious complaint was the effect of odour from both the holding ponds and the waste disposal grounds. Although Mr. Buhr stated his opinion that the odour from the holding ponds would be less objectionable than that from the landfill site - and the Environmental Engineer, Mr. Moche stated that he had not experienced bad odours on occasions when he had inspected the holding pond site. (Note: The Commission inspected the site following the hearing and all members found the odours from the pond to be highly objectionable and easily detected downwind from the site at a considerable distance away.) At least some of the residents were living there before the dump site was established.

Mr. Froese produced a dead duck that he had recently found on the road by the holding pond site that had evidently landed in the soap stock holding ponds and became oil coated, which rapidly caused its demise. This is apparently a fairly regular occurrence. A letter written to the Commission by Pauline Klassen related that in 1988 a flock of about 35 Canada geese had landed in the holding ponds, with only one survivor. On this point, Mr. Buhr stated that bird scaring devices such as are utilized by some sunflower growers are utilized at appropriate times of the year to attempt to prevent birds from landing in the ponds.

With the continual increase in the Company's production capacity and the resulting requirement to keep expanding the holding ponds, the farmers were concerned about the recent purchase of additional disposal site property and probable continued expansion closer to their property, with greater volumes of both smoke and odour. They wondered if there was any other long term solution that would provide relief to the conditions that cause their concerns.

The Environment Department

Mr. Adrian Jackson, chief of the Air Pollution Control Section and Mr. Clem Moche, Environmental Engineer with the Water Pollution Control Section represented the Environment Department.

In response to questions, Mr. Jackson stated that he had no direct experience with the burning conditions at that specific holding pond disposal site but that from knowledge about the material burned and general site conditions he would expect that these burning conditions would not result in a clean burn and that a lot of black smoke would be produced. He was of the opinion that this burning should not be allowed to occur again in the future.

Mr. Moche provided an overview of the Company's application and a summary of comments from various government departments and agencies that had been received by the Environment Department.

Included in this documentation was a groundwater pollution hazard appraisal prepared by the Water Resources Branch of the Department of Natural Resources. This report stated that shallow aquifers do not occur in the area of the disposal site, that deep aquifers are covered by a thick clay layer and are under artesian pressure, and that aquifer pollution by seepage from the holding ponds is not likely. Mr. Moche added his analysis that pollution of nearby dugouts as a result of seepage from the holding ponds was unlikely and therefore not a concern of his Department in this instance.

With regard to possible discharge of liquid effluent from the holding ponds to the municipal drains, thence to the Buffalo Drain, leading to the Red River, Mr. Moche had obtained samples of holding pond "water" for analysis, although he had never been able to acquire a sample of the actually discharge effluent on the occasions when this occurred. An extremely high biochemical oxygen demand, a fairly high oil and grease content and high levels of sodium characterized this liquid. Mr. Moche confirmed that this liquid was not suitable for application to agricultural land as an alternative means of disposal.

Mr. Moche stated that the holding pond cells were sterile and therefore without bacterial activity. He confirmed that the Company had recently introduced some cultured bacteria in an attempt to facilitate greater organic breakdown; However the bacterial action was anaerobic and, considering the high strength wastewater, satisfactory treatment would require a long retention time.

It was Mr. Moche's understanding from discussions with Mr. Buhr that the Company was considering the installation of aeration units which would accelerate the reduction of organic content in the wastewater and reduce the odours from the current anaerobic process. (Note: This odour reduction would only be achieved in the particular cells where aeration equipment might practically be installed - probably the last treatment or polishing cell, prior to discharge. This would likely not reduce odours from the total pond, complex to any significant degree.)

While Mr. Moche did not believe that groundwater or dugout water was treated by the holding pond facilities and operation he believed that, if the holding ponds were permitted to discharge effluent to the municipal ditches, the effluent should meet normal municipal lagoon discharge effluent quality limits as applied by Departmental license to most municipal lagoon facilities throughout Manitoba.

Mr. Moche recommended that any such permitted discharge should not be allowed during winter months.

Mr. Moche tabled a report from the Regional Wildlife Technician of the Department of Natural Resources which referred to complaints from area residents of a variety of birds dying over the years as a result of landing in the holding ponds. The use of scare devices or the installation of overhead protection to prevent birds from landing was suggested.

Mr. Moche also referred to concern expressed by the Department of Highways about the spillage of soap stock or bleached clay onto the highway from trucks transporting this material from the Town to the disposal site. This has evidently caused slippery conditions on P.T.H. 30 sufficient, at times, to create a hazard to the travelling public.

DISCUSSION AND CONCLUSIONS

C.S.P. Foods Ltd. is obviously an important and valued industry to both the Town of Altona and the Rural Municipality of Rhineland. Since this Company commenced operations in 1943 it has grown from a processing capacity of 20 tonnes per day, as a crushing facility only, to a current capacity of 800 tonnes per day - a forty fold increase - with the ability to both crush oil seed and refine the oil. Refinery operations were constructed in 1950 and the Company representative stated that in today's market a crushing plant is probably not a viable operation without a refining facility.

With this success and progress - and primarily caused the necessity of refining the oil - has come the need to dispose of increasing quantities of both soap stock and bleaching clay.

The soap stock has been disposed of in joint Town and Municipality owned holding ponds developed for the specific and sale use of C.S.P. Foods and increased in size over the years to take care of increased production and accumulated waste, with both burning on the ponds and discharge of liquid effluent being practiced from time to time in order to reduce the waste in the ponds and prevent the necessity of further pond expansion. On occasion the ponds have overflowed, probably at times of heavy and prolonged precipitation. It is the Commission's understanding that when the holding ponds were first constructed, about the year 1976, that they were operated as a part of the Town and Municipality waste disposal grounds. Only recently were the ponds identified and registered under the Environment Act as a separate operation, distinct from the adjacent landfill facility.

The bleaching clay, which also results from the refining operation, has been accepted as a waste in the landfill site on a daily basis (approx. 4 tonnes per day). This has been either burned independently at the landfill site or hauled to other solid waste from the Town and Municipality for burning on site and subsequent landfill disposal.

The foregoing operations have been the Town's and the Municipality's joint method of acceptance of the Company's waste byproducts and their disposal. The volume of these wastes has increased over the years with increased plant production, resulting in increased holding pond construction, an accumulation of waste and recently the acquisition of additional land for current and to come future holding pond expansion.

Although this disposal may not have resulted in serious degradation effects on the surrounding environment, this method of disposal has been established and continued for the handling of ever-increasing volumes of

waste, to the discomfort and concern of neighbouring residential farmers, at least some of whose homesteads were established prior to the establishment of the soap stock holding ponds and even the landfill operation. Unlike municipal sewage lagoons which, if properly designed and operated, may create an obnoxious odour for only a relatively short time in the spring of the year, the holding ponds emit what the Commission found to be a very objectionable odour which likely prevails during the entire summer season, varying to some degree with prevailing climatic conditions. As well, in the past, from time to time, soap stock has been burned from the top of holding pond cells. Evidence was given that these burning events have lasted for up to a week's duration and that under such burning conditions large volumes of black and odorous smoke were produced, which neighbouring residents found to be extremely obnoxious.

While the Company seemed willing to accept a condition of no future burning of holding pond soap stock, the other daily waste byproduct from the Company's operation, bleaching clay, is burned daily at the landfill waste disposal site, along with other municipal waste. Although the storage and burning of other Municipal waste must by its nature cause objectionable smoke and odour to nearby residents, the bleaching clay doubtless adds a considerable additional daily volume of smoke and odour into the surrounding atmosphere. This continues on a more or less daily basis all year round.

The disposal of the municipal waste, which is necessary to the comfort and well being of all of the citizens of the Town and Municipality, as well as the viability of the Company, is accomplished by means of what the Commission believes to be the cause of considerable discomfort and legitimate concern of nearby residents. As no definite alternative to the present disposal method for either the soap stock or the bleaching clay had as yet been identified or adopted by the Company, neighbouring citizens were concerned that the holding ponds would continue to expand on the newly acquired land bringing them even closer to neighbouring property with additional smoke and odour.

Nearby farmers with dugouts were concerned but the possibility of

groundwater and/or dugouts by seepage from the disposal site; however, an analysis of this possibility by the Groundwater Resources Branch of the Department of Natural Resources as well as by the Environment Department officer determined to the satisfaction of the Commission that contamination of these resources was not threatened.

Another identified concern was that wild birds, usually waterfowl, sometimes land in the holding ponds and become coated with soapstock which causes their death. The Company evidently uses bird scaring devices at appropriate times of the year in an attempt to prevent this but these have not been entirely successful. Some form of overhead screening was suggested to prevent this. Considering the extent of the holding ponds and the magnitude of this problem, the Commission does not believe that physical screening of the ponds is practical or warranted; however, the Company should continue and perhaps increase its use of scaring or other useful devices that may be employed to prevent birds from landing in the holding ponds.

RECOMMENDATIONS

The Commission recommends:

1. that burning of soapstock in the holding ponds not be permitted.
2. that the license for operation of the holding ponds include appropriate limits, terms and conditions regulating the quality of any liquid effluent discharge from the holding ponds, similar to quality requirements for effluent discharge from municipal wastewater treatment ponds and also addressing the grease and sodium content of the effluent.
3. that the Company be required to continue its investigation of alternatives to the present methods of disposing of both soapstock and bleaching clay including:

- (a) alternative beneficial uses of the soapstock.
 - (b) extraction of refined oil from the bleaching clay.
 - (c) the use of bacteria and aeration equipment to improve the present treatment of soap stock waste in the holding ponds.
 - (d) the use of a suitable incinerator, designed to burn both soap stock and bleaching clay under controlled conditions to produce acceptable air emissions. (Note: the possible recovery and utilization of the heat energy produced should be a part of this investigation).
- 4. that the Company be required to report annually to the Environment Department on the progress of the investigations required by Recommendation No. 3, above.
 - 5. that no further expansion of the capacity of the Company's operation be permitted without the development of a more environmentally acceptable method of disposal of both soapstock and bleaching clay.
 - 6. that on or before December 31, 1991, the Company be required to register a proposal with the Environment Department detailing an alternative method of disposal of both soapstock and bleaching clay - such proposal to be considered at a public hearing of the Clean Environment Commission.
 - 7. that the Town and Municipality be required to complete fencing and drainage improvements to the soapstock disposal pond area prior to October 31, 1989.
 - 8. that the Town and Municipality be required to file a plan with the Environment department prior to December 31, 1989, for the

planting of a suitable shelter belt of trees around both the soapstock disposal ponds and the adjacent waste disposal grounds - such planting to be undertaken in the spring of 1990.

9. that the Town and Municipality and/or the Company be required to employ the use of suitable explosive or other bird scaring devices, as approved by the Manitoba Wildlife Branch, at the soapstock holding ponds during periods of the year as specified by the Wildlife Branch.