Province of
British Columbia

Ministry of
Environment

ENVIRONMENTAL APPEAL BOARD
Victoria
British Columbia
V8V 1X5

Appeal No. 82-02 POL.

JUDGEMENT

PERMIT NO. - P.E. 6293 issued to the Village of Chase for the discharge of municipal sewage to the ground by infiltration and/or spray irrigation.

APPEAL - The appeal was supposedly against the issuing of the permit under any conditions. Mr. Lepin, Chairman of the Chase Irrigation District, stated at the hearing, however, that he wanted the Board to make one of the three following decisions, listed in their order of preference:

1) Cancel the Permit in total, because of the many areas of uncertainty.

2) Uphold the permit, but insure that all properties within 2,000 ft. of the sewage treatment plant are piped up to the Village water supply.

3) Uphold the permit, provided that further testing, as recommended by Mr. Topp, insures that no adverse effect will result to wells in the 2,000 ft. area.

HEARING INFORMATION

The hearing was held on January 26th, 1982 in the Delta Canadian Inn in Kamloops, B.C.

The Board members in attendance were:

Mr. Frank Hillier, P. Eng. - Chairman
Dr. Arthur Renney, Ph.D. - Member
Mr. John O. Moore, B.Sc. - Member

Miss Shirley Mitchell - Official Recorder

REGISTERED APPELLANT

Chase Irrigation District, represented by the following:

Mr. Kent G. Woodruff, L.L.B. - Legal Counsel
Mr. Kenneth W. Lepin - Chairman of the Chase Irrigation District

WITNESS - Mr. Larry C. Topp, P.Geol. of Kala Groundwater Consulting Ltd.

Judgement - Village of Chase (Cont.)

REGISTERED OBJECTORS - None

LIST OF EXHIBITS

A) - Presentation of Kenneth W. Lepin
Chairman - Chase Irrigation District and Concerned Affected Citizens.

B) - Underwood McLellan Ltd.
Alternate Sites and Methods Evaluated

C) - Aerial Photograph - The Proposed Effluent Treatment Site.

D) - Letter to Mr. J.G. Spencer, Waste Management Branch from the Director and Medical Health Officer, Ministry of Health, William P. Moorehead M.B.CL.B., M.Sc., FRCP(C).

E) - Submission of the Village of Chase, containing thirteen subsections.

F) - Underwood McLellan Ltd.
Hydrogeological Evaluation
Proposed Infiltration Basin
Tarry Property, Chase, B.C.

SUMMARY OF APPELLANTS' PRESENTATION (In part)

Mr. Woodruff was legal counsel and spokesman for the appellant. Mr. Lepin and Mr. Topp both gave testimony. Mr. Woodruff opened the Irrigation District's presentation with the following comments:

Mr. Woodruff - He stated that his client had no disagreement with the engineering of the sewage treatment system itself. His client was satisfied that it would work properly, if the geology in the area was proven to be acceptable. He said that the Irrigation District, however, was uncertain of the geology, and felt that there may be some problems develop in the drinking water supply to the wells of people living in the area. He said that they suspected there had been insufficent testing done, both on the site and off the site.

He pointed out that some of the wells in the area were as much as 60 years old, built at a time when no precautions, such as capping or cement lining, would have been provided to

prevent contamination from surface and sub-surface polluted water. He said that this was his client's main concern. The people living in the area were fearful that polluted water would seep through the ground from the sewage treatment system and get into their wells.

To alleviate this concern, he said that the Irrigation District would like further testing to be done, so that the Village was absolutely sure there would be no contamination of the wells in the area. Alternatively, and perhaps preferably, they would like to see the Village of Chase extend its water system out to those properties which had wells and were within 2000 ft. of the sewage treatment plant.

As a final item, he said the Irrigation District wanted item H, Site Screening, in the "Letter of Transmittal" enforced now and not left to the discretion of the Regional Manager of the Waste Management Branch.

Mr. Lepin - He stated that he represented the Chase Irrigation District and also the residents of the VLA Flats - the area in question. His presentation was as follows:

1) He felt that the geology of the area could be unsuitable for the sewage treatment plant.

2) He felt that the testing done by the Village was not sufficient to prove or disprove whether the geology was adequate.

3) He felt that Underwood, McLellan Ltd. had a vested interest in the project and had been allowed to exert too much influence on the Waste Management people who had issued the permit.

4) He stated that if the permit was upheld, he wanted further testing to be done up to 2000 ft. from the sewage treatment plant, in all directions, by a firm whose primary concern was not the design and promotion of the system.

5) If the permit was upheld, he did not want the Village of Chase to do the monitoring of the test wells. He felt that in future years the infiltration beds may become over-taxed, for many reasons. He felt that an independent laboratory should do the monitoring, up to 2000 ft., for as long as the discharge takes place.

6) If the permit was upheld, the preferable alternative was an alternate water supply, such as an extention of the Village of Chase water system to all residences within 2000 ft. of the sewage treatment plant, prior to operation of the plant.

7) If the permit was upheld, he wanted the whole area fenced, as well as overhead protection, to prevent livestock and birds from getting into the treatment lagoons.

8) If the permit was upheld, he wanted it made subject to releasing the land from the Agricultural Land Reserve.

9) If the permit was upheld, he wanted the sewage treatment plant landscaped by professional landscape architects and maintained over the years. This was to be done to improve aesthetics and odour.

10) He indicated that the Waste Management people were lax and ineffective in the prosecution of violations under the Act.

Mr. Topp - He stated that he was a professional hydrogeologist, with some 16 years experience, and that he owned his own consulting firm.

He had been hired by the Chase Irrigation District to make what amounted to a cursory review of the available information, which consisted of the Underwood McLellan Report, topographical maps, air photographs, correspondence and talking to people with experience in the area.

He said he liked the concept of the infiltration and spray irrigation system. His concerns, however, were in respect of the geology of the area and he questioned whether all the necessary studies had been done and whether alternate sites had been properly evaluated.

He felt that if the chosen site had been improperly evaluated, and the geology was not as predicted, there could be danger to the wells in the area. From his examination of the existing information, he thought there may be an interconnection between sub-surface sand and gravel and the sand and gravel of a deep aquifer which supplied the wells in the area. He said that if this interconnection did exist, polluted water could contaminate the aquifer, which would be almost impossible to clean up. This aquifer was a valuable source of water, both now and in the future.

He also questioned whether effluent could escape from the sewage treatment plant, along old creek channels which appeared to cross the site of the proposed plant.

Two of his specific concerns on the hydrogeology of the area were as follows:

1) From the diagrams contained in the Underwood McLellan report, he stated that there appeared to be insufficient evidence on the nature of the impervious silt layer between the sub-surface soil and the deep aquifer soil, to ensure that polluted water would flow laterally along this impervious strata.

2) The rate of groundwater movement had not been established and as a result, the horizonal permeability of the soil has not been assured.

He was of the opinion, that without quantifying these various hydraulic parameters, some of the further calculations had very little meaning. He recommended that further studies should be done. Mr. Topp did not recommend that the permit be cancelled.

SUMMARY OF THE PERMIT HOLDER'S PRESENTATION (In part)

The following people appeared as representatives or witnesses for the permit holder, the Village of Chase.

Miss Lorena P.D. Staples, L.L.B. - Legal Counsel
Mr. Jake Frank - Alderman and Chairman of the Committee of Council for the Sewage System.

WITNESSES - Mr. Don Johnson, P.Eng. - District Manager Underwoood McLellan Ltd.
- Mr. Brian Johnson, P.Eng. - Municipal Department Head, Underwood McLellan Ltd.
- Dr. Robert Nowak, Ph.D. P.Geol. - Senior Engineering Geologist, Earth Science Divison, Underwood McLellan Ltd.

Judgement - Village of Chase (Cont.)

Miss Lorena Staples was legal counsel and spokeswoman for the Village. Mr. Jake Frank and the three witnesses all gave testimony before the Board.

Miss Staples opened her defence of the Village's case by stating that it appeared that the only area of disagreement between the Irrigation District and the Village was whether or not the Village of Chase should be required to extend its water system at this time to persons with wells within 2000 ft. from the sewage treatment plant, or whether, as the Village contends, it should be required to abide only by the conditions of the permit,(i.e. - item "F" in the Letter of Transmittal).

She stated that according to the permit requirements, the Village was required to monitor five existing wells for chemical contamination, once the sewage system had gone into operation. These wells were the Currie, Ducross, Mutch, Smith and Tronson wells. She further stated that the Village was also prepared to monitor any additional wells in the area up to 2000 ft. from the sewage treatment plant. Mr. Lepin estimated that this extended area probably contained another five wells.

Miss Staples said that if any of the aforementined wells (i.e. Currie, Ducross, Mutch, Smith and Tronson) become contaminated because of the sewage treatment plant, the Village was prepared to extend its water system to that contaminated well. Also, for the period of time required to construct the extended pipeline, they would truck in potable water.

Mr. Frank - He stated that the Village was in great need of the proposed sewage treatment system. All of the Village was currently on septic tanks, and some of these septic tanks were even under buildings. He further stated that because of the population density within the Village, a number of people were having difficulty with the operations of their septic tanks. Because of these problems, there was an immediate need to take some positive action. He also pointed out that because of these conditions, the current situation within the Village was not in compliance with the requirements of the Ministry of Health.

He stated that the Village needed to increase the population density on its lands in order to take care of the planned and expected growth of the community. The only way they could accomplish this end was by converting the Village to a proper sewage collection and treatment system. He said the Village had the ability to finance up to $2,500,000 for the system, but if the construction of the system was further

delayed, this amount of money might not be enough, particularly when current inflation rates were considered.

Mr. Frank gave further testimony concerning farming in the area of the proposed sewage treatment plant. It was his opinion that there was not much farming being done in the area. The lot sizes were too small and farming was not too viable. It should be noted, that Mr. Lepin disagreed with this opinion.

Mr. Don Johnson - His testimony was of a general nature, dealing with the history of events leading up to this hearing, a description of the proposed sewage collection system within the Village and a description of the proposed treatment and disposal plant, and how they would be operated. Included in his testimony were the following comments:

1) The current population of the Village of Chase was about 1,700 to 1,800 people. The effluent treatment plant would be designed for approximately 3,000 people

2) The average person contributes about 80 to 100 gals. of sewage per day to the environment.

3) The sewage disposed to the ground from an aeration treatment lagoon is much improved over that of a septic tank disposal field.

4) Aeration lagoons and infiltration systems produce very little odour.

5) The properties of the raw sewage coming from Chase would probably be in the order of:

BOD_5	-	200 - 300 ppm
Suspended Solids	-	200 - 300 ppm
Phosphorus	-	5 - 9 ppm
Nitrogen	-	25 - 35 ppm
Coliform Count	-	1×10^7/100 ml

6) The properties of the waste water after treatment in the aeration lagoon would be approximately:

BOD_5	-	27 ppm
Suspended Solids	-	33 ppm
Phosphorus	-	5 ppm
Nitrogen	-	21 ppm
Coliform Count	-	5.6×10^4/100 ml

7) The Pollution Control Guidelines require that municipal effluent not exceed the following:

Infiltration	-	BOD	- 130 ppm
		S.S.	- 130 ppm
Spray Irrigation (Forage Production)	-	BOD	- 45 ppm
		S.S.	- 60 ppm

8) The Chase Permit requires the Village sewage treatment plant effluent not to exceed the following:

BOD - 45 ppm
S.S. - 60 ppm

In closing off his testimony, Mr. Johnson reviewed the problems with the various sites which had been investigated and the reason for selecting the Tarry site. He also commented on a number of points of interest in the permit.

Dr. Robert Nowak - His testimony was of a very technical nature, dealing with site characteristics, environmental impact and case histories.

Before dealing with the specific site in question, the Matti-Tarry site, he gave the Board a general outline of how his organization carried out their investigations. Their objectives were to get a site profile, find the control layer and assess the renovation potential of the soil. In order to collect this information, their usual practice was to drill a series of test wells on the site in a pattern which would give them good representation of the existing conditions. From these tests wells, they could then determine the geological and ground water restraints to sewage effluent absorption and other characteristics of the site.

In connection with the Matti-Tarry site, Underwood McLellan drilled seven test wells. Their findings and other comments were as follows:

1) The test wells showed a soil composition of an upper layer of silt and clay (not too homogenous), followed by an underlying strata of sand and gravel and then a further silt layer below the sand and gravel.

2) The top layer of soil (silt and clay) had exceptionally good infiltration rates.

3) The next layer of sand and gravel formed a good under-drain system.

4) The third layer, which was silt, was impermeable and sloped in a northwest direction towards the river. The calculated velocity of water flow towards the river along this layer was estimated to be in the order of 0.716 meters per day. The expected residency time of the effluent ranged from 1,100 days under the worst conditions to 2,900 days under the most optimistic conditions.

5) The renovation capacity of the soil and the treatment system was good. This capacity applies to suspended solids, BOD_5, PO_4 absorption, NO_3 storage capacity and bacteria and virus removal.

6) In the design of a hydrogeological system, Underwood McLellan Ltd. use a safety factor of 20 times the expected failure level.

7) Effluent can be put into a land infiltration basin, and as long as there is an unsaturated zone of at least 10 feet below the basin, the effluent will be stripped of its contaminents and will then be of an acceptable standard to be introduced into an aquifer supplying drinking water ground wells. This is a fact accepted in most places around the world. At Chase, it is calculated that the distance to the water mound below the infiltration basin will be about 16 ft., the nearest well will be 1,000 ft. away, and effluent will not even be introduced into the same aquifer which feeds the wells around the sewage treatment plant. In addition to this information, Dr. Nowak stated that from his observations in the area, he is sure that the impermeable layer between the top and bottom aquifers is intact and that there will be no exchange of water from the top aquifer to the bottom one, which supplies the wells in question.

In his closing statements, he reviewed the case histories of a number of installations of the type to built at Chase. They all appeared to be very sucessful.

Mr. Brian Johnson - He gave a very short presentation, mainly devoted to the costs of extending the Village water system to the sewage treatment plant area. He stated that in the event of trouble with the sewage treatment plant, the Village was committed to supply potable water to an area encompassed by a circle of a 1,000 ft. radius from the center of the treatment

plant. He said that there are seven wells in this area, of which three are hydraulically upstream from the treatment plant, which would leave four to be serviced. The extension required for the water system would be about 2,400 ft. The cost to service 3 wells (one of the four is owned by the Village), by installing a 3-inch water main, would be about $40,000. If a 6-inch or 8-inch main were installed, to take care of possible housing developments in the future, it would then cost about $100,000. He further stated that if the radius of the encircled area were increased to 2,000 ft. (as the Irrigation District wanted) another $12,000 could be added to each of the foregoing estimates. He also noted that there are only two more additional wells in this extended area.

The commitment of the Village in regards to the alternate water supply is as follows (Staples in Summary):

1) They will only supply wells which exist at this time.

2) Water supply will be limited to domestic use only (i.e. - no irrigation).

3) Recipients will pay for the water at the going user rate.

SUMMARY OF THE WASTE MANAGEMENT PRESENTATION (In part)

The following people appeared as representatives of the Waste management Branch:

Mr. John Spencer - Processing Engineer
Waste Management Branch
Victoria, B.C.

Mr. Allen Stephens - Regional Manager
Waste Management Branch
Williams Lake, B.C.

Mr. Spencer was the spokesman for the Waste Management Branch. He had also prepared the documentation for the permit. Mr. Stephens was at the hearing in support of Mr. Spencer, as he had been the former Municipal Section Head for the Branch at the Kamloops office. He did not give any testimony.

John Spencer - He said that he was the man who had prepared the permit for the Waste Management Branch. He also said that this proposed sewage treatment plant was a very good one, one of the best systems he had been involved with, including the

conditions of the surrounding effluent receiving area. He said he would hate to see the Village refused. He pointed out that the sewage treatment plant was capable of treatment beyond the requirements of Pollution Control Objectives for Municipal Type Waste. Rather than see that plant "not go", he felt that the extension of the Village water system was not too high a price to pay, if that's what it would take.

Mr. Spencer also pointed out that the Ministry of Health was not happy about the present situation within the Village of Chase (i.e. septic tanks) and the sewage treatment plant was really needed.

Mr. Spencer, in his preparation of the permit documents, indicated that the conditions included met all the requirements of the Pollution Control Guidelines for Municipal Effluent to Land, and the requirements of the Ministry of Health, including those in Dr. Moorehead's letter of May 27th, 1981, with the exception of the continuous yearly monitoring. He said the monitoring on a year-to-year basis was not too reliable, and he had, therefore, altered the monitoring program to start 90 days before the discharge of any effluent to the infiltration basins, with samples to be taken every month for 24 consecutive months. He said that the Waste Management people would use a dye in the effluent, and he was confident that any leakage to the Currie, Ducross, Mutch, Smith and Tronson wells would show up in that length of time. Further, he said that the permit called for the installation of an additional 5 or 6 observation wells which would be used to monitor the water surface elevation of the ground water table perched on top of the dense grey silt layer, which was approximately 5-6 meters below the surface of the ground.

He said there was no chance of any contamination of the surrounding wells from bacteria. He said that the only possible contamination of these wells, and it would be extremely unlikely, would be from nitrates. He then said that if this should happen, Section F of the "Letter of Transmittal" would come into force, but only provided the level of nitrate-nitrogen concentration reached 0.2 mg/L or more above the natural levels existing within the wells before the discharge commenced. He said the Canadian drinking water standards allowed a concentration of nitrate-nitrogen of 10 mg/L before the water was considered unsafe. By limiting the permit to a concentration of 0.2 mg/L, the Waste Management Branch was giving the Village enough lead time to extend their water system to the contaminated area before there was any chance of the nitrate-nitrogen level reaching 10 mg/L. Also, he confirmed that it was his understanding that the Village would bring in potable water (presumably by truck) to the people affected, should the 0.2 mg/L level be exceeded.

DECISION

The Environmental Appeal Board has considered all of the evidence submitted to it in the appeal hearing on Pollution Control Permit No. P.E. 6293, issued by the Director of Pollution Control to the Village of Chase, and has decided to uphold the Permit without change, except for Item "H" in the "Letter of Transmittal". Item "H" shall be amended to read as follows:

Site Screening

The Village shall provide sufficient suitable trees and/or shrubs to screen the site from the public view. The Regional Manager shall be consulted as to what will be required.

The Board has the following comments:

1) The appellant failed to produce convincing evidence in support of the merits of his appeal.

2) The village of Chase, on the other hand, presented evidence of a well engineered and researched sewage treatment system, with adequate provision to take care of any possible mishaps which might arise from anomalies in the geological characteristics of the site.

3) The consultants, Underwood McLellan Ltd. appear to have done an extensive and detailed study of the geological characteristics of the site.

4) The Waste Management Branch produced a good permit, fully in keeping with the intent of the Pollution Control Act and its responsibilities under that act.

5) The Village offered to monitor existing wells between the 1,000 and 2,000 ft. area from the sewage treatment plant. The Board considers this provision unnecessary, particularly in view of the five additional observation wells called for in the permit.

6) The Board notes that the "built-in" safety factors in the design of the sewage treatment plant are

extremely conservative; both in respect of the plant and the characteristic of the surrounding geology. The Board feels that it is extremely unlikely that any of the wells in the area will experience any form of contamination from the sewage treatment plant.

7) On the basis of Items 2 and 6 of the Board's comments, it would appear to be unreasonable to require the Village to spend some $40,000 to $52,000 at this time to protect what essentially amounts to 3 wells from something that isn't likely to happen; and particularly when there is a good plan to take care of the situation should a problem arise in the future.

The appeal is, hereby, dismissed.

F. A. Hillier
Chairman
Environmental Appeal Board

February 20, 1982