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Report On Sanitation at Fort Rae, N.W.T.

Following a receipt of the following report prepared by Mr. J. Grainge, Department of National Health and Welfare, a meeting was held by the Commissioner, staff of the Territorial Government and representatives of the Department of National Health and Welfare. At this meeting it was decided that no further development would be permitted in the settlement of Rae until sanitation conditions could be improved.

It was decided to discontinue the discharge of the treated sewage into the lake and have this sewage hauled by truck to a site which would avoid contamination of the lake or the immediate surroundings of the settlement. Sewage and garbage were to be disposed of at separate sites. Because of the poor color and high level of chlorination, it was decided that unless these could be improved; water would be hauled for the settlement from the well at the new townsite of Edzo.

Immediately following this meeting, Mr. E. Cotterill, the Regional Director from Fort Smith Region and Mr. S. Hancock, Director of Local Government together with other members of Territorial staff visited the settlement of Fort Rae and held a public meeting to advise the people of Rae of these decisions. At the meeting with the residents of Rae arrangements were made to carry out a settlement clean-up program and to control the loose dog problem in the settlement. The people of Rae requested that the Department of National Health and Welfare conduct a more effective public health education program in the settlement and they have been requested to do so. Decisions arrived at are being implemented at the present time.

May 9, 1970.

May 7, 1970

Completed by C. H. ...
Following reports from several sources regarding the standard of municipal services presently provided to the community of Rae, a meeting has been held in Yellowknife between senior officials of the Department of National Health & Welfare and the Government of the Northwest Territories. Representatives of the Territorial Government then attended a public meeting in Rae to discuss these services, and to advise the residents of the decisions that had been made by the two groups of officials.

Although Chief Suzie Bruneau was not able to attend the meeting, Councillor Alex Charlo spoke for the 33 members of the Dogrib band in attendance. The Territorial Government was represented by S. W. Hancock, Director of the Department of Local Government, and E. M. R. Cotterill, Regional Director for the Fort Smith Region.

The residents of Rae were advised that the Department of National Health and Welfare studies indicated that the Government water supply presently available to the community was free from contamination, and that the water from the water treatment plant could not be connected to the recent outbreak of gastroenteritis. They felt, however, that the water in Marijn Lake, from which many residents continue to supply their needs, is insanitary and is likely to increase in contamination. This is due to the poor natural drainage of the community which inevitably results

in ground refuse and other contaminants being carried directly into the lake, particularly during the spring run-off period. Many residents had preferred to take water direct from the lake because of the poor appearance and high chlorine content of the treated water presently provided to the community.

The Rae residents were advised that because of the safety of the present water supplied, the Government did not propose making any immediate change in its water service to the community. However, because of the many complaints about the appearance and the taste of this water, they planned to initiate an immediate study into alternate sources of supply. Following a suggestion from Charlie Charlo, a former vice-president of the N.W.T. Indian Brotherhood, the community was invited to submit to the Government their proposals for suitable alternatives. It was hoped that a satisfactory solution would be found within the next month.

The officials advised the meeting of the immediate steps planned by the Territorial Government to reduce the level of contamination in Maridn Lake. Meetings were already underway with existing garbage and sewage contractors, to carry all collectable wastes and refuse to a new dumping area, well removed from the community and the drainage pattern in the lake. Treated sewage presently disposed of in the lake after treatment at the plant, would also be trucked to the new disposal area.

The meeting was also advised of the \$12,000 that was available to them under the Government's existing community services grants, which could be used to carry out a community clean-up program, and make some payment to local dog officers. It had been agreed at the public meeting

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that a considerable part of the problem stemmed from the community's large population of dogs, many of which ran loose.

In order to underline the importance of reducing the further flow of contaminants into Mariqn Lake, the meeting was advised of the Government's decision to place a freeze on all further new construction within the community. A number of Government projects previously planned for this summer would be cancelled, including ten Indian houses under the Federal Government's northern housing program. Also affected will be private individuals and companies planning to build in Rae. This decision will be enforced through the immediate establishment of a Development Area under the Area Development Ordinance. In making this decision the Territorial Government recognized the recommendations contained in reports prepared by the Department of National Health and Welfare.

Following considerable discussion with Rae residents at the general meeting the Territorial officials have made the following additional recommendations to the Commissioner:

1. That the Department of National Health and Welfare be requested to give greater attention to the development of a more effective Public Health education program in the community of Rae. It was felt that regardless of the measures being planned to improve the existing water supply and waste disposal within the community little would be accomplished without the wholehearted support and understanding of the local residents.

2. That some consideration be given to providing assistance in the form of building materials to families wishing to remain in, or relocate to, outlying areas. During the public meeting many residents had expressed the view that unsatisfactory housing conditions on the land had forced some families to move to Rae, thereby accentuating the overcrowding in that community.

3. That a study be initiated immediately to provide a plan for the present townsite of Rae, ensuring satisfactory drainage and upgrading existing road facilities.

--Information Services 873-7442
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REPORT RE OUTBREAK OF GASTROENTERITIS, RAE, N.W.T.

EXAMINED - April 22 and 23, 1970.

SUMMARY

Rae is an Indian settlement seventy miles by road northwest of Yellowknife. The insanitary living conditions in the settlement and the households of the natives result in frequent intestinal sicknesses and occasional epidemics.

Several reports by this office dating back to 1938 have contained criticisms of the settlement. Six different reports dating back to July 27, 1959 have contained recommendations to avoid creating a bigger sanitation problem by refraining from increasing the population. This could have been accomplished by not building the road into the settlement and also several buildings including schools, teachers' residences, powerhouse, etc.

During February, 1970 an outbreak of gastroenteritis occurred with twenty severe cases among children under two years of age, three of whom died.

An inspection and this report on the problem were made at the request of Dr. A.O. Uygur, Area Director, Mackenzie Area, Medical Services Dir., D.N.H. & W., Edmonton.

INTRODUCTION

Rae is situated on two islands and the adjacent mainland on the east shore of the Marian Lake. It is seven miles by low standard secondary road from the Yellowknife-Ft. Providence-Edmonton highway.

The population of Rae is 1,037 of which all but 81 are Indians (Dogrib). The population has risen by approximately 30% during the last ten years.

Located there is a two-man R.C.M.P. detachment, a medical officer of health with the D.N.H. & W., an eight-classroom school, a 27-bed hospital owned by the Gray Nun Order, an R.C. mission with two priests, two stores (one of which sells gasoline), a cooperative making and merchandising handicraft with a territorial manager, and two truck companies (one of which has the garbage hauling contract and the other the water and sewage plants operation and the water and sewage haulage contracts.

Living conditions in the settlement are insanitary on account of the bacterial pollution of the drinking water, the children's play areas and the walkways and roadways being wet and polluted by sewage including human and dog wastes.

REPORT ON OUTBREAK OF GASTROENTERITIS

RAE, N.W.T.

PREPARED BY

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EDMONTON 2, ALBERTA

This report outlines the underlying reasons for this outbreak of disease which involved many children, sixteen of whom were hospitalized and three died. It re-emphasizes the desirability of eliminating construction in this settlement where the natural features render the site to be hopeless. Many lives have and are being lost as a result of the non-acceptance of this long-standing advice.

April 30, 1970

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This outbreak of gastroenteritis is the last of a series of epidemics which date back many years.

GASTROENTERITIS OUTBREAK

The first case of severe gastroenteritis of this outbreak occurred in late January, 1970. Within two weeks time sixteen cases, all children under two years old, had been admitted to the hospital. The causative organisms were identified in the Alberta Provincial Laboratory of Public Health as pathogenic types of E. coli. See laboratory report, Appendix A. Undoubtedly, most people in the community were affected, but only the very sick were taken to the doctor.*

Gastroenteritis (severe diarrhea) is endemic throughout northern Canada. In this current outbreak in Rae, the first case(s) was (were) either a visitor(s) or a resident(s) who returned from visiting elsewhere. The insanitary conditions in the homes are conducive to the spread of intestinal diseases, however the rapidity with which the disease spread to all sections of the community suggests that the water supply was the main mode of transmission of the organisms. Undoubtedly, many cases were a result of direct contact. Insanitary conditions of the water supply are such that it is a most likely avenue for the transmission of disease organisms.

WATER SUPPLIES

At the time of the outbreak, the water supply for 120 families, which represents a major number of native people in the settlement, was very primitive. Water is hauled by people carrying it in buckets from two holes through the ice on Marian Lake. See aerial photo attached. The buckets would have been set on the floors in the houses and at several places on the ground between the houses and the water holes. The roads and paths throughout the settlement are grossly polluted with human and dog wastes, which are tracked into all the houses. In most cases, the bottoms of the buckets would have been badly contaminated and would have polluted the water in the holes.

Water from the water treatment plant cannot be connected with the outbreak of gastroenteritis, because the channels connecting the plant to the sources of pollution were frozen at the time.

* - Gastroenteritis is an intestinal disease which is confined almost exclusively to children under two years of age, and largely to children under one year. Other people may become infected and thereby carriers, but they do not become ill.

The period from the ingestion of the organisms to the onset of symptoms (diarrhea and vomiting) may be as little as 24 hours. The younger the child and the larger the dose, the shorter the incubation period. Ref. Infectious Disease, Epidemiology and Clinical Practice, by A.B. Christie.

The water from the water treatment plant is distributed to the homes of the non-Indians and the Indians who are living in rental homes. The cases of the diseases were not limited to the families using water from the water holes, however no cases were reported among the non-Indians.

The Indians do not take the water from the plant for three reasons:

1. The charge is \$5 per residence per month.
2. The people have observed that the visible garbage in the lake floats to the west side of the water reservoir from around all the community including the channel receiving the effluent from the sewage plant. They state that if the water is to be carried by bucket, then better water is obtained from water holes at opposite ends of the channel than that which is obtained from the plant. They stated that they know about the pipes through the berms which allow the water from the lake to enter the reservoir. People complain of taste at 0.2 mg/l concentration in reservoir.
3. They have found that generally the water from the plant is muddier than that which can be obtained from the lake at other locations around the settlement.

Water Treatment Plant

There is no point in repeating our regular criticisms of the water treatment plant. It is very costly to maintain. The filter has no value. Chlorinating the water is the only useful purpose served by the plant, and chlorination of polluted turbid water is not satisfactory. See report on bacteriological tests, Appendix D.

Report on Physical Tests on Water Samples Taken April 22, 1970

	<u>Turbidity Units</u>	<u>Color Units</u>
Unfiltered Water	30	80
Filtered Water	29	80
<u>N.B. Canadian Drinking Water Standards -</u>		
Acceptable Limit	5	15
Objective	Less than 1	Less than 5

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Discussion

The reasoning of the people regarding the adverse features of the water treatment plant is sound. The water system should never have been built and once having been built, should never have been maintained at great cost. It should be abandoned immediately, and all water hauled from the well at the proposed new school site until such time as a better water supply can be constructed. It is likely that many people would carry this water from a reservoir if they can be assured that it would be safe.

SEWAGE TREATMENT PLANT

The sewage treatment plant is an extended-aeration type which has been described and criticized in statements and reports both prior to and following its construction. No repetition is necessary.

Although maintenance costs have been excessive, the plant has always been poorly maintained. At the time of the examination, it was completely shut down for replacement of two sewage pumps, which pumps have had a very short operational life. In the approximately eight inspections at distinctly different times by engineers of this office, the plant has never been operating with effluent running out the outlet. However, on two occasions the plant was operating and the sewage was overflowing the tanks into the building.

A single hypochlorinator is provided for chlorination of the effluent. However, this is not sufficiently reliable considering the proximity of the effluent disposal point to the community and the water supply.

Discussion

The effluent from the sewage plant runs into a channel in the middle of the settlement. This creates a dangerous problem of pollution in a water course where many people will continue to obtain water and where children play. The sewage plant should never have been built and maintained at continued great cost. All sewage should be hauled, without benefit of treatment, to some pond which is not on the watershed of Marian Lake. This will involve a long haul because there is only silt in the neighboring area. It will be impossible to construct a sewage lagoon from such soil.

GARBAGE DISPOSAL

A contractor hauls away all the garbage. The nuisance grounds is a mile away along the road to the highway. Disposal would be satisfactory if the garbage were confined and tipped over the edge of the hill. Unfortunately, it is widely distributed, and never piled up. It contains bags of toilet sewage, which are exposed to flies, stray dogs and carrion birds.

The garbage should be segregated as much as possible so that much of it can be burned. It should be dumped over the far edge of the slope of the hill; regularly bulldozed together; and soil from the top of the hill bulldozed over it.

People complain about the lack of regular pickup. Much of the complaints stem from the fact that garbage barrels are not available. It is difficult to pick up loose garbage on the ground, especially in winter. It would be desirable to use 12 cu ft plasticized paper bags for garbage, as outlined in our report on sanitation in Greenland.

DESCRIPTION OF THE COMMUNITY

Planners of the community did not understand the basic facts of living in a primitive community, and consequently they failed to consider the ultimate development of this settlement.

The garbage and sewage from the residences of the Indians and the dog manure is mixed up with the runoff water in the settlement. What little soil there is in the community is silt or swampland, without loam cover. Conditions are not suited to seepage of rain water and snowmelt, and consequently the polluted runoff water either runs directly into the water surrounding the settlement or remains in the yard where children play, dogs are tied, and people walk.

By actual count, 650 dogs are tethered in the community. It is estimated that there are more than 100 loose dogs, many of them owned by the non-Indian members of the community.

The construction of new houses on the silt soil, which is so difficult to drain, has created a very difficult problem. However, the crowning action to render the community impossible was the construction of the silt roads on the bare rocks. Until this was done, there were periods in summer between the rains when the ground on the island dried up and the lake was a little less polluted with wastes. However, the roads blocked off the drainage so that the islands, which were formerly the parts of the community which were the closest to being clean and the most photogenic, are now the muddiest. This situation continues throughout the summer.

The site was probably first chosen because there were less mosquitoes on the bare-rock outer island. Now the ponds have brought the mosquito-breeding grounds to this haven.

MOSQUITO CONTROL

The high mosquito population*, which has been created by the puddles, which are in turn caused by the roads, are difficult to control. DDT cannot be used because of the world-wide pollution by this long-lasting biocide. The Arctic Ocean especially should be protected because the polar ecological cycles are fragile.

The use of other insecticides should not be used in this community, until information is obtained regarding safety with respect to water supplies of both the people and the dogs.

NEW CONSTRUCTION

The new homes, which are scheduled to be built in the old settlement, will add to the insanitary conditions which continue to worsen. They should not be constructed within the settlement unless they contain pumpout sewage tanks which are adequately protected from freezing. The roads to these houses and the entire lots should be built up with gravel to a depth of no less than two feet.

RECOMMENDATIONS

1. All water should be hauled from the well at Edzo.
2. All sewage from the sewage plant should be hauled to a suitable pond at a location where the effluent will not flow into Marian Lake.
3. The garbage disposal methods should be improved.
4. Plasticized paper garbage bags should be obtained.
5. Future homes, which are constructed in Rae, should contain pumpout-type sewage tanks which will contain all sewage. The tanks should be completely protected from freezing by insulation and electrical heating cables.
6. The lots of future houses should be completely filled with gravel to a minimum depth of two feet.
7. Insecticides for mosquito control should not be used unless information is obtained regarding safety with respect to water supplies.

* - Warnings in this respect are contained in most of our reports which recommended avoiding the buildup in this community.

8. The roads over bare rocks should be examined and wherever possible the soil of the roads should be removed to reduce the polluted ponds in these areas.

9. Dogs, which are unessential to the livelihood of the people, should not be allowed in the settlement, even if on a leash. All loose dogs should be shot.

10. Positive steps should be taken immediately to reduce the population in Rae.

J. W. Grainge
J.W. Grainge, P. Eng.
Regional Engineer

APPENDIX A

E. COLI ISOLATIONS FROM RAE, N.W.T.*

<u>Spec. No.</u>	<u>Spec. Taken</u>	<u>Patient's Name</u>	<u>Doctor's Name</u>	<u>Serotype</u>	<u>Clinical Details</u>
E1857	Jan. 21/70	WASHIE, Norman**	Bhimji	0119:814	-
E 2118	Jan. 27	WASHIE, Joyce	"	"	-
E 2119	Jan. 27	GON, Georges	"	"	-
E 2547	Feb. 2	ERONCHI, Billy	"	"	Diarrhea
E 2992	Feb. 7	QUITTE, Marie-Janet	"	"	-
E 3587	Feb. 14	McKENZIE, Beatrice	"	0111:84	Treatment aerosporine 5 days
E 3596	Feb. 11	STEINWARD, Richard	"	0119:814	-
E 3954	Feb. 21	EYAKFWO, Freddy	"	0111:84	Took aerosporine for 6 days
E 4248	Feb. 24	DRYNECK, Robert*	"	0119:814	-
E 4881	Mar. 3	SMITH, Julie+Ann	"	"	-
E 5560	Mar. 9	BISHOP, Josephine	"	"	-
E 5563	Mar. 6	BLACKDUCK, Elvis	"	"	-
E 5559	Mar. 7-	GON, Georges	"	055:85	-
E 5561	Mar. 7	FOOT-IN-HELL, Edward	"	055:85	Diarrhea 3 days
E 5722	Mar. 11	BEAULIEU, Agnes	"	0119:814	-
E 6649	Mar. 24	SMITH, Julie	"	055:85	-
E 6756	Mar. 25	MERCREDI, Kevin	"	055:85	-
E 8216	Apr. 13	WETRADE, Marilyn	"	0119:814	-
E 8215	Apr. 14	TLOKKA, Maryann	"	055:85	-

B. The list does not include the name of Georgina Flunky, who was one of the first cases and was sent to the hospital in Yellowknife.

Unaccountably, the name of G. Nitslza is not included. He died after admittance.

* - Report by the Alberta Public Health Laboratory.

*- Died.

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APPENDIX B

SUMMARY OF PREVIOUS RELEVANT MEETINGS AND REPORTS
OF WHICH WE HAVE KNOWLEDGE

October 29, 1938 - Report by A.H. Perry.

The report outlines the unfavorable natural conditions in the site which result in the contamination of the water supplies by the sewage and garbage. The permanent population at the time was approximately 125. Mr. Perry reported that there was an outbreak of dysentery among the natives who came to Rae for treaty payment. He recommended chemical toilets in the R.C. hospital which were subsequently installed.* (These and the pumpout sewage tanks were probably the only reasonably safe disposal of sewage in the settlement throughout its history).

July 6, 1959 (approx.) - Meeting in Fort Smith with the Assistant Administrator and the District Engineer, Northern Administration Br., D.N.A. & N.R. and J.W. Grainge. Also present were J. Anderegg and L. Hubbs, Research Sanitary Engineers, Arctic Health Research Center, Alaska.

All agreed that the very poor natural features in the community were such that it was not practical to improve the insanitary conditions. Funds should not be spent on building a proposed new powerhouse, school, other buildings and seven-mile road to Rae from the Yellowknife-Ft. Providence-Edmonton highway, which would result in an increase in population and thereby compound the problem.

July 27, 1959 - Report by J.W. Grainge.

Following is a summary of recommendations from the report.

"1. It is suggested that there is no practical good solution to the public health problems in this large community as long as it is confined on these rocky islands and swamp covered peninsula. A logical solution is to move the settlement to a more suitable site before the population increases further. This should be investigated this summer before \$165,000 is spent on building construction in this settlement and \$260,000 to \$290,000 is spent on construction of a road to this settlement.

* - Discontinued in 1965 or 1966 when the hospital was connected to the new sewage plant.

"2. If it is decided not to move the site, then water should be hauled from beyond Frank's Channel over the road to be ~~constructed this year.~~

"As much sewage and garbage as possible should be hauled away to a suitable disposal site along the proposed road to Frank's Channel."

August 10, 1959 - Letter from Dr. P.E. Moore, Chief Medical Health Officer of the N.W.T., Ottawa to Mr. R.G. Robertson, N.W.T. Commissioner, Ottawa.

"It is my recommendation that, before there is any further building at this settlement, serious consideration should be given to Mr. Grainge's proposals. We have all been aware for many years of the rocky nature of the terrain at Fort Rae and of the difficulties in finding water. I believe that further expansion of this settlement at this particular location will bring us serious health problems in the future.

"This report underlines the importance of taking into account sanitation requirements at the earliest stages of northern settlement planning."

August 10, 1959 - Mr. John A. Kerr, a newly hired, former engineer of this office, was so moved by the high incidence of communicable diseases, the current outbreak of gastroenteritis and the insanitary conditions at Rae, that he wired to the Prime Minister of Canada in Ottawa.

August 11, 1959 - Report by Mr. John A. Kerr describing insanitary conditions and statistics concerning epidemic of gastroenteritis.

August 11, 1959 (Approx.) - Report by Dr. J.F. Pyper, Medical Officer of Health, Rae listing cases of gastroenteritis.

"No. of Cases"

"Period"

3	May 1 to 31, 1959
5	June 1 to 15, 1959
6	June 15 to July 15, 1959
23	July 15 to August 8, 1959

September 30, 1959 - Letter from Mr. J.R. Menzies, Chief, Public Health Engineering Division, Ottawa to Mr. B.G. Sivertz, Director, Northern Administration Br., Ottawa.

"Because of the character of the site, it seems obvious that a sewerage system cannot be installed. Reliance must be placed on small units such as pail or vault privies, chemical toilets, etc., with all wastes transported to a nuisance ground off the watershed of Marlan Lake. The construction of a road next year would facilitate this operation.

"It seems obvious that this is an exceptionally poor site for even a small community, that there is no obvious year-round water supply even with first-class treatment, with the possible exception of a stratum of sand below the lake bottom, and that only small sewage disposal units can be utilized.

"Sicknesses reported in this community is very serious, especially dysentery, which affects the young children most seriously. Consequently, every effort should be made to take fullest possible advantage of all favorable factors with a minimum of further delay, if this community is to remain in its present location. Detailed information concerning sickness can be obtained from Northern Health Services, Charles Camshell Hospital, Edmonton, Alta."

January 25, 1962 - News item, Edmonton Journal. See Appendix C.

January 26, 1962 - Letter from J.V. Grainge to Mr. W.R. Edmonds, Chief, Public Health Engineering Division, Ottawa, subsequently forwarded to Dr. P.E. Moore, Director, Indian & Northern Health Services, Ottawa and from there to the Director, Northern Administration Br., Ottawa.

"The second point I wish to make clear is that in 1959 after discussions with the district engineer at Fort Smith, Dr. Davies and others, I recommended that Rae be moved to a more suitable site. It was pointed out in my report that the capital investment in Rae was not great at the time, but that there were plans for extensive construction. I stated that Rae was in a very poor location for various reasons and it should be moved before there was further expansion and a road constructed. It was Dr. Davies' opinion that the Rae hospital, the only building of consequence, would be abandoned in the not-too-distant future.

"Subsequently, the road was built for more than one-quarter million dollars. There has been considerable construction ~~since then~~. Now an expensive water system will be built, and still the raw water will be contaminated by runoff over the bare rocks from the filthiest settlement in the north."

January 29, 1962 - Letter from J.W. Grainge to Mr. W.R. Edmonds, Chief, Public Health Engineering Division, Ottawa, subsequently forwarded to Dr. P.E. Moore, Director, Indian & Northern Health Services, Ottawa and from there to the Director, Northern Administration Br., Ottawa.

Letter outlines specific recommendations which had been made to the consulting engineer.

"Sewage Disposal - Sewage would have to be hauled to a lagoon located inland so that the effluent from it would not affect the water in the lake around the settlement.

"Water Supply - An infiltration test well should be drilled as recommended by Mr. L.V. Brandon and if that failed, complete treatment should be provided with the water coming from deep water between the two main parts of the settlement.

"I do not know anything about the water plant designed. I presume a package plant as designed and sold by one of the companies in that business was specified. I was not informed of any water coagulation tests, so I doubt if there were any."

August 24, 1962 - Letter from Dr. John S. Willis, Northern Health Services Division, Ottawa to Mr. B.G. Sivertz, Director, Northern Administration Br., Ottawa.

"The attached copies of correspondence about an outbreak of gastroenteritis at Rae, N.W.T. remind me strongly of Dr. Moore's letter to you dated August 10, 1959, enclosing a report by Mr. J.W. Grainge, Public Health Engineer. In that report Mr. Grainge condemned the water supply and sewage disposal practices at Rae and in the covering letter Dr. Moore said: "I believe that further expansion of this settlement at this particular location will bring us serious health problems in the future."

"Now we find ourselves with 87 children admitted to hospital with dysentery, of whom 26 have had to be fed intravenously to save their lives. Three children have already died. There can be little doubt that the impossible terrain, with scarcely any soil for the reception and natural purification of body wastes and with the lake providing a tempting dumping place for excreta and a convenient source of water (looking deceptively fresh and clean); has forced a situation upon us that could occur and reoccur, year after year, getting worse as more people crowd into the settlement and provide more contamination of the rocks and the lake."

August 31, 1962 - Report by J.W. Grainge pointing out insanitary conditions.

October 19, 1962 - Meeting in Fort Smith with senior officials of Indian Affairs Br., D.C. & I. and Northern Affairs Br., D. N. A. & N.R., Dr. K.F. Butler, Area Director, Northern Health Services, and J.W. Grainge.

In a letter dated October 23, 1962 from J.W. Grainge to Mr. W.R. Edmonds, Chief, Public Health Engineering Division, Ottawa (c.c. to Northern Affairs Br. and Dr. K.F. Butler), Mr. Grainge wrote some of the statements which he made to the meeting because they were not mentioned in the minutes.

"1. Provision for trucking drinking water from a safe source was very important and to a much lesser extent so was provision for trucking sewage and garbage to a ponding site, nevertheless there would still be serious disadvantages in this site. The water around the settlement would continue to be polluted with (1) fecal wastes from many people who would not use the sewage facilities, (2) wash water wastes which may also contain dysentery and other pathogenic bacteria and which it would be impractical to haul away, and (3) the wastes from as many as 500 dogs which may contain ova of hydatid disease as well as pathogenic bacteria. The Indian Affairs Br. should therefore continue to encourage natives to move to sites which are more suitable from economic and public health points of view.

"2. The design of permanent water supply and sewerage systems as shown on plans in the engineering office in Ft. Smith (and which may not be final plans) contained basic faults.

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"Water Supply - The proposed water source is an infiltration pond with a bottom dimension of 70 ft X 70 ft which would be built almost entirely of clay hauled to the site at a total cost of somewhat over \$60,000. This is a very large expenditure and the quality of the water to be obtained is not known as far as I know.

"Sewage Disposal - The plans were not very clear but an activated sludge unit was to be shown. Presumably there would be primary treatment with the effluent being aerated or it might be one of the many total oxidation units which are available. The effluent would spill to the lake near the settlement. Even if the climate were warmer and therefore more suitable for this type of operation, the basic purpose of a sewage disposal system here should be to remove sources of bacterial contamination of the water around the settlement. There would be considerable bacterial reduction in the treatment system, nevertheless this could not be depended upon, especially in cold weather when the efficiency would be very low.

"The main claim for such units is their satisfaction of the oxygen demand of the sewage, and in this respect there is no lack of receiving capacity in the lake."

November 7, 1962 - News report and editorial, News of the North. See Appendix C.

November 7, 1962 - Letter from J.W. Grainge to Mr. W.R. Edmonds, Chief, Public Health Engineering Division, Ottawa pointing out deficiencies in proposed water and sewage treatment plants.

"Water Supply - The water supply is primarily an infiltration reservoir with a little gravel in two sides which would admit some surface water. The gravel, as specified, is not of value as a slow sand filter and the gravel in the bottom would soon plug up if turbid water entered through the berms. If water is to be obtained through the deeper gravel deposits then a well screen is required, not a large open reservoir. The Northern Affairs engineer will test such a well as soon as equipment is available. I sent him water sample bottles and provided verbal instructions.

"Sewage Disposal - The plans of the consulting engineer were to put sewage plant effluent into a long neck of water leading to the lake, which is a water hole for many of the residents of the settlement. This is undesirable. In addition I do not believe a sewage treatment plant is worthwhile in the Northwest Territories. Note that I have been given credit for saving the municipal district of Yellowknife more than \$10,000 per year by recommending bypassing their plant."

November 29, 1962 - News report, News of the North. See Appendix C.

February 22, 1965 - Report by J.W. Grainge upon request by Dr. M. Hatas and Dr. G.C. Butler, Medical Services Dir., Edmonton relative to the proposed construction of a large school there.

"7. Finally, but of no means of minor importance, is the fact that any further building in Rae adds to the population and the very bad public health conditions which are already there. The high incidence of the gastroenteritis and dysentery points up the need to reduce, not increase, the number of people in this community.

"Eventually, the population of Rae will increase to a point where piped water and sewerage systems will be constructed out of sheer public health necessity. The low lying, solid granite rock site is unsuitable for subsurface systems, so that expensive above-ground utilidors and sewage lift stations will be necessary. Roads will be required, and because of the rocky terrain traversed by utilidors, they will be very costly and very poor, and for these reasons may not be built.

"In summary, we believe that enormous public health problems will be encountered if a large school and teacherage are constructed in the vicinity of Rae, the most insanitary community in the Northwest Territories. We strongly recommend that they be located on one of the many beautiful sites along the shore of Great Slave Lake, a few miles south. If the costs attendant on servicing these buildings with water and sewer utilities are studied, the choice of a lake site will permit an economic saving on both the short and long range bases."

May 21, 1965 - Letter from Dr. D.R. Kinlock, formerly Medical Officer of Health at Rae, to J.W. Grainge.

"I read with dismay of the proposal to build a residential school at Rae, N.W.T.

"To even consider establishing a residential school complex at Rae is the height of folly.

"The physical characteristics of this location make it incompatible with healthy living for its inhabitants. Marian Lake is little more than a slough, and a heavily polluted slough at that. The rock outcroppings which are in preponderance over soil in that area make safe sewage disposal almost an impossibility. The less said about the engineering monstrosity perpetrated by Northern Affairs as a partial solution to this problem the better. A notable feature of the rocky island upon which the majority of Indians live is the sea of excrement produced by the large number of dogs tethered there. The vicinity of the settlement has been denuded of firewood upon which most inhabitants depend for fuel. The white fish of Marian Lake are infested with the encysted larvae of a fish tapeworm which grows to a length of 30 ft in the intestine of the fair proportion of Rae Indians who harbor them.

"Attracting further inhabitants to the Rae area, as must inevitably happen if a school and residence are built, is a disservice of the worst kind to the Indian population, for it can only serve to perpetuate the dismal conditions and misery that every physician to serve this area has seen and protested against."

May, 1965 - J.W. Grainge addressed separate meetings of the Rae Community Club and the Rae Advisory Committee where there was general agreement that the school should be built at another site.

May 27, 1965 - Letter from J.W. Grainge to Mr. R.J. Orange, Administrator of the Mackenzie, D.N.A. & N.R., Fort Smith.

"While I was in Rae, I took photos of the water system and brought in a sample of the earth for testing by a soils engineer. I discussed the question with one of the top soils engineer, Mr. Bernard of Bernard, Curtis, Hoggan Engineering & Testing Ltd.

"He confirmed my previous statements to you and he confidentially states that the job will run at least \$50,000 (based on my information that there was little good clay soil available). He suggests that both a hydraulics engineer and a soils engineer should make a study before spending any more money. In my opinion, you will spend \$10,000 per year forever if a thorough study is not made now.

"I made a few enquiries about the utilidor and it seems that it needs to be completely rebuilt. In view of the fact that the engineering on the sewage plant is deficient in the first place, I do not think that repairs to the utilidor (\$5,000 to \$10,000) will be justified."

May 31, 1965 - Letter from Dr. J.F. Pyper, Medical Officer of Health, Rae to J.W. Grainge. She deplored the decision to build a large school in Rae.

June, 1965 - Dr. G.C. Butler, Chief Medical Officer of Health of the N.W.T. addressed the meeting of the N.W.T. Council and made a strong report on the need to locate the proposed school at the new site. Subsequently, J.W. Grainge reported to the N.W.T. Council on the same matters.

June 23, 1965 - News report, Edmonton Journal. See Appendix C.

June 24, 1965 - News report, Edmonton Journal. See Appendix C.

June 24, 1965 - Mr. J.W. Grainge addressed a meeting in Rae of the Band Council and other members of the community including the administrators, the Yellowknife officers of the both the Northern Affairs Br. and Indian Affairs Br., and the public health doctor and nurse. He showed slides of Rae and other communities throughout Alaska and northern Canada and pointed out desirable features in a townsite. Following the meeting, he asked for a show of hands, and there was overwhelming support for the siting of the proposed school at a better location. The Chief and several councillors stated that they had no objection.

July 14, 1965 - Report Re Water Supply, Rae, N.W.T. by J.W. Grainge.

August 9, 1968 - Report Re Sanitation, Rae, N.W.T. by J.W. Grainge.

The report pointed out the deficiencies of the ill-conceived water and sewage treatment plants and other problems of sanitation.

February, 1969 - Mr. H.A. Lawrence, President, Associated Engineering Services Ltd., Edmonton addressed the N.W.T. Council meeting pointing out the favorable features of the new site. At the meeting the Chief and council made a report which contained very little relative information.

A delegation representing the young people in Rae requested the council to establish a community at the proposed new school site on the highway where ~~there would be opportunities for~~ employment.

Later in the evening, Messrs. Lawrence and Grainge met informally with several members of the N.W.T. Council and re-emphasized the hopelessness of the site, and recommended that new residences be constructed at the proposed school site.

The same evening the Chief and councillors met informally with Messrs. Lawrence and Grainge. After general discussion on the meaning of the N.W.T. meeting, the Chief and councillors stated that the school should be at the proposed new site and possibly many people who did not have dogs, boats, and other equipment might move there.

North Road Building Hits Housing Snag

OTTAWA (CP) — Old houses sometimes get in the way when you build new roads in northern communities.

Deputy Commissioner W. G. Brown told the Northwest Territories Council Wednesday this is one of the problems that add cost and confusion to northern road building.

"The houses are everywhere and the roads have to go everywhere or else you would have to go through half of the houses," said Mr. Brown, chief of the federal territorial division.

The council, scheduled to end its winter session here today, passed estimates calling for the installation of roads and water and sewage services in three of the territories' most backward communities, Fort Providence, Fort Rae and Fort Norman.

"The refuse (at Rae) left on the rocks is washed into water that is pumped up again for people to drink," said elected member A. P. (Pat) Carey, Fort Smith bush pilot. "I wouldn't stop there for a cup of coffee."

Commissioner Gordon Robertson said "conditions are deplorable at Rae."

Rae now will be provided with a sewage lagoon, a reservoir, pump house and water treatment plant. The sewage will be picked up by a 500-gallon capacity truck and the water delivered to residents in another truck the same site.

Total cost for the Rae project will be \$120,000, shared by the federal and territorial governments. Residents will pay for the system over a number of years, but their monthly bills will be subsidized.

EDMONTON JOURNAL
JANUARY 25, 1962

Death takes no hold

(News Editorial)

Seven have died at Fort Rae since June directly or indirectly as a result of drinking the water available there to the native people.

Five of the deaths are the direct result of the contaminated water and the two others can be traced to illness each was a patient suffering from some other illness whose resistance had been weakened by the water that they could not get much longer enough.

There is nothing new about this—doctors, public engineers, health officials and others have predicted and long—and warned something like this was sure to happen. And now it has.

It is comforting to be told that a meeting was held in Ottawa last week to talk about the problem—meetings in Ottawa do not really supply the water truck which should be used to bring the people the spring water.

Just at this time the Government of Canada and the people of Canada are spending thousands of dollars in an effort to find four missing men in the Himalayas and no one begrudges the expenditure—and the eyes of Canada watch this because its grant.

But there's nothing dramatic about an Indian died of dysentery, so Canada is indifferent it seems—would take only modest expenditure to save this situation and perhaps countless other lives.

NEWS OF THE NORTH
NOVEMBER 7, 1962

NEWS OF THE NORTH
November 29, 1962

BEST ATTAINABLE
IMAGE

Rao water supply query answered

A couple of weeks ago this paper printed a questions from Mrs. Hardie and a partial answer to her from Hon. Walter Dinsdale on the Fort Rae Water supply, said to be responsible for a number of deaths.

The rest of the minister's answer on Monday of last week is given below:

Mr. Dinsdale: Mr. Speaker, perhaps I might add a few words to what was said on this subject on Thursday last as recorded on page 918 of Hansard.

In addition to the immediate measures taken in connection with this problem, a more comprehensive program is under way. A new five year financial agreement was concluded with the Northwest Territories early this year and under this agreement a program for dealing with this long standing health problem has been made available under which the federal government will assist the territorial government in providing reservoirs, water treatment and sewage treatment facilities in northern communities. Fort Rae was the first place listed for action even before the outbreak of this year. Design work has already been completed for the necessary installation. Financial provision is included in my departmental estimates for 1963, and I am advised that the territorial government is also making provision for its share of the costs.

North Council Asks

Journal Staff Writer

YELLOWKNIFE — Territorial council Tuesday recommended that the federal government make a town plan for the Rae area.

The plan is to include a site for a proposed \$3 million school and residence.

Council acted after meeting in Rae Sunday with the chief of the Dogrib Indian band who said that nearby Russell Lake has band approval as a new site.

Council included Russell Lake in the "Rae area."

Federal officials felt that although Rae is the most unsanitary centre in the Territories, projects to solve that problem by relocation of the centre required Dogrib approval in principle or the natives would not accept the school-residence outside of the present Rae site, about 70 miles east of here.

8 DIED IN 1962

Eight persons died at the community of Rae during a 1962 outbreak of gastro-enteritis, believed caused by bad water. The community was recently listed as dangerously unsanitary by national health department engineers.

Mackenzie District Administrator R. J. Orange said the

school is planned for opening in September, 1965.

About 1,600 of the 1,600 Dogrib Indians in the Rae-Yellowknife area live in Rae along with a supporting white population of about 100.

RIGHTLY INTERPRETED

Elected Councillor Peter Baker, whose Mackenzie North riding includes Rae and who speaks Dogrib, assured council that Dogrib Chief Jimmie Burgo was correctly interpreted Sunday as including Russell Lake in what the natives call the Rae district.

Council was told that Russell Lake has the kind of soil required for proper sewage handling, a good supply of drinking water, space on dry land for the school-residence and playgrounds, and would permit construction of house basements as the centre develops.

SEWAGE-LADEN WATER

The present Rae site is covered with pockets of sewage-laden water on the rocky ledge on which it sits. The tap water has been found to be as polluted as the lake it's drawn from, despite a treatment plant.

Elected Councillor Lyle Trimble (Mackenzie Delta), who has opposed relocating Rae, agreed to the relocation Tuesday.

SUMMER HOMES OF THE DOGRIB TRIBE

... there are also a modern dance and winter shacks

Insanitary Rae:

Proposed Move To New Site Has Stirred Controversy

By RALPH ARMSTRONG
Of The Journal

RAE, N.W.T. — The federal government calls this Indian community the "most unsanitary" in the Northwest Territories.

About 1,000 whites, built on a rock ledge on shallow Marian Lake, a polluted lake at the end of Great Slave Lake's North Arm.

Settlement of Indians here, 70 miles northwest of Yellowknife, was caused by fur traders intercepting the Dogribs as they travelled south to sell furs to a Hudson's Bay post.

Today, the settlement has a

Catholic hospital and a trading store. Several health care workers, including a doctor, live here. Hudson's Bay store provides housing for 100 federal employees, school, law community hall and Indian dwellings which range from one-room huts to modern houses.

WATER ON STRINGS

Water, sewage and hydro plants have been built to support the community. The water is delivered by truck to all homes with grooves in gutters carry it to the houses and to drink lake water. The sewage plant isn't used for technical reasons. A garbage-waste pickup operator for the white residences, and for Indians when they prepare refuse properly for

collection. The hydro is used by the white community.

It is not an unpleasant place to live. At this time of year, people are "tired" about the "white" Indian dog teams yap and bark, go to wander about in the town. The whites generally play multiple roles: parents, teachers, the community club advisers.

Chief of Rae, according to federal government reports, is unopposed in favor of building the school and residence proposed to serve the burgeoning Indian population.

Canada wants to build there, a new hospital, several miles from Rae on land more available to construction, to clearing for playgrounds, to sanitation installation, drinking water supply, and so on.

The Territorial Council visited Rae Sunday. Council met about 50 Dogribs, headed by their highly-respected Chief Jimmie Bruno, in the school. It was a well-attended meeting, similar, except for the color of skins, to an "outside" meeting.

Chief Bruno doesn't speak English. He's in his 50s and an unchallenged Dogrib spokesman. He has wanted to keep his band at the present site of Rae. Sunday he agreed in principle through Dogrib and white interpreters, to a start in re-locating Rae by construction of hospital, school and residence a few miles away.

CHANGE SOON

This is hailed by federal officials as a change in attitude which they say they require before re-location can begin. Otherwise, they say, re-location

(Continued on following page)

BEST ATTAINABLE
IMAGE

North Council Asks Town Plan For Rae

Journal Staff Writer

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CHIEF JIMMIE BRUNO

... heads Indian community of 1,000 at Rae

might be of things but not people. The Dogribs would stay and have to be transported back and forth to facilities at the new site.

public health engineering report to the Territorial Council says: "Any further building in Rae adds to the population and

public health problems, "and it is important to recognize this now." The moving cost "could not be excessive" because most of the Rae buildings are small. The move would save "more than \$100,000 by not running a power line into the settlement," for example.

Dogribs Approve Relocation

By RALPH ARMSTRONG
Of The Journal

RAE, N.W.T. — The head chief of the 1,600 member Dogrib Indian tribe has approved the principle of building a hospital, school and hostel outside Rae.

The approval enables proposed re-location of the community core.

Chief Jimmie Bruné, 60, described as a "nearly endless influence in the Territories," told a meeting of the Territorial Council and 100 Rae residents Sunday the tribe considers near-by Russell Lake a suitable building site.

Rae is described by the

affairs department officials as unsuitable for habitation from every angle.

About 1,600 Dogrib Indians, and 100 whites, mainly civil servants, live there now. The village is 70 miles northwest of Yellowknife.

MANY REQUESTS

This was the Territorial Council's second visit to the century-old Indian centre and the Dogribs took the opportunity to ask for:

○ Regular garbage and sewage pickup with Liacs on regular incomes paying for the service, and the Indian affairs branch paying the treaty Indians without income;

buildings" as soon as possible in a three-year project to build 45 new houses.

○ A new, central washing unit with washers and dryers; a shower room, public toilets and a janitor.

No Indian owns a washing machine in Rae, council learned. None has adequate washing facilities.

Commissioner B. G. Sivertz said the washing centre and housing would be discussed with Indian affairs. He also encouraged the Dogribs to continue to work toward solution of these problems.

OVERLOOK SERVICES

for the sewage and garbage removal by the government public

health engineer has reported council that any kind of water delivery and sewage and waste collection "may not be sufficient to prevent serious outbreaks of disease" because the services are not adequate.

APPENDIX D

DEPARTMENT OF NATIONAL HEALTH AND WELFARE
 PUBLIC HEALTH ENGINEERING DIVISION
BACTERIOLOGICAL ANALYSIS OF WATER

RAE, N.W.T.

<u>Date</u>	<u>Location</u>	<u>Standard Plate Count</u>	<u>Coli- form MPN</u>	<u>E. coli. MPN</u>
<u>1969</u>				
Apr. 26	Water Reservoir - Lake	Over 3,000	0	0
Apr. 26	Water Plant - Lake	2,200	23	9.1
Apr. 3	Water Reservoir - Lake	1	0	0
Apr. 3	Water Plant - Dipped	350	7.8	0
May 10	Water Plant - Dipped	120	150	0
May 17	Water Reservoir - Tap	Over 3,000	0	0
May 17	Water Reservoir	-	-	-
May 17	Water Plant	200	150	3
May 17	H.B. Point - Dipped	120	0	0
May 29	Water Plant - Lake	8,000	15	7.3
May 29	Water Reservoir - Lake	1	0	0
June 13	Water Reservoir - Lake	600	0	0
June 13	Hospital - Tap	Over 3,000	0	0
June 13	Water Plant - Lake	2,750	0	0
June 27	Water Plant	11,100	0	0
June 27	Water Reservoir	1	0	0
July 11	Water Plant	20	0	0
July 11	Water Reservoir	880	0	0
July 25	Water Reservoir - Lake	Over 3,000	0	0
July 25	Water Plant - Lake	20,000	22	2
Aug. 8	Water Reservoir	1,000	0	0
Aug. 8	Water Plant - Dipped	10,000	6.8	4.0
Aug. 26	Water Reservoir	30	9.1	0
Aug. 26	Water Plant - Dipped	10,000	49	4.0
Sept. 3	Water Reservoir	80	0	0
Sept. 8	Water Plant - Dipped	7,000	15	0
Sept. 22	Water Plant	60,000	7.8	4.5
Oct. 10	Water Reservoir	Over 3,000	0	0
Oct. 10	Water Plant	58,000	2.0	0
Oct. 30	Water Plant	2,000	0	0
Oct. 30	Water Reservoir	Over 3,000	0	0
Nov. 28	Water Reservoir	Over 3,000	0	0
Nov. 28	Water Plant	48,000	0	0
Dec. 17	Water Plant	1	0	0
Dec. 17	Water Reservoir	10	0	0
<u>1970</u>				
Jan. 26	Water Reservoir	-	0	0
Jan. 26	Water Plant	Over 3,000	0	0
Feb. 18	Water Plant	1	0	0
Feb. 18	Water Reservoir	350	0	0

(Bacteriological Analysis - Cont'd.)

<u>Date</u>	<u>Location</u>	<u>Standard Plate Count</u>	<u>Coli- form MPN</u>	<u>E. coli. -MPN-</u>
<u>1970</u>				
Mar. 13	Reservoir	205,000	2.0	0
Mar. 13	Plant	Over 3,000	0	0
Apr. 3	Water Reservoir	115,000	0	0
Apr. 3	Water Plant	Over 3,000	0	0
Apr. 14	Lake - Hospital	Over 3,000	0	0
Apr. 14	Pumphouse	Over 3,000	0	0
Apr. 20	Lake - Bucket*	Over 3,000	1500	0
Apr. 20	Lake - Bucket*	30	24	0
Apr. 20	Lake - Pipe Intake*	1	0	0
Apr. 22	Raw Water - Plant	11,000	0	0
Apr. 22	Filtered Water - Tap	Over 3,000	0	0
Apr. 23	North End of Channel	5,300	0	0
Apr. 23	Lake - North End of Is.	1,000,000	1500	7.3
Apr. 23	Lake - Dipped	7,200	3.6	0
Apr. 23	Lake - Dipped	3,000	0	0

* - Sampled by Don Loree, Indian Association, Edmonton.