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167051 - Texada Gravel on Gabriola Island

Dear Nicholas Doe:

Thank you for your letter of May 8, 2008, regarding the use of Texada gravel on Gabriola Island's roads. I am pleased to hear you have met with my ministry's local District Manager, Barbara Thomas, to discuss the material further.

My ministry is responsible for maintaining a safe road network in a cost-effective manner and I appreciate your detailed comments regarding the aggregate being used by our maintenance contractor, Emcon Services Ltd., and our maintenance activities.

Ministry staff are looking into the drainage and road surface concerns you have raised, and are coordinating efforts with with Emcon Services Ltd. to determine areas for drainage improvement and base construction. Ministry staff are also conducting additional tests on the quarry material, and Barbara Thomas will be pleased to discuss this matter with you further once the analysis is complete.

Thank you again for taking the time to write.

Sincerely,  
Kevin Falcon  
Minister

Copy to: Barbara Thomas, District Manager  
Vancouver Island

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The Honourable Kevin Falcon  
Minister of Transportation  
Province of British Columbia  
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May 8, 2008

Texada Gravel on Gabriola Island

Dear Minister

You have on file, I know, several letters expressing the concerns of Gabriolans on the use of a material known as Texada Gravel by Emcon Services on the unpaved roads of Gabriola Island. These complaints are set out, albeit in rather dramatic and graphic fashion, on the website [www.texadaslime.org](http://www.texadaslime.org). I should like, if I may, to add my own observations to these complaints. Although not a professional geologist, I am a retired engineer, still registered as a P.Eng., and I have earned, as the result of my geological research on Gabriola, the status of “Honorary Research Associate” with the Earth Sciences Department at the Malaspina University-College, soon to be the Vancouver Island University. I have written several technical reports on the Gabriola Texada Gravel problem and these have been well received by Barbara Thomas P.Eng., Acting District Manager for the Vancouver Island District, and have been respectfully acknowledged by Mr. Frank Rizzardo, the President & General Manager of Emcon Services.

Before outlining the technical reasons for the problems, let me say at the outset that it is my belief that the difficulties that your staff are having in resolving these problems stem from the fact that:

1. the obligations of Emcon Services are bound by contractual arrangements with your ministry;
2. these contractual arrangements require Emcon to meet the provisions of your ministry’s “2006 Standard Specifications for Highway Construction”;
3. the Texada Gravel, while meeting the requirements of the said specifications, fails to be satisfactory for reasons that are NOT included in the specifications;
4. the Emcon senior management are not familiar with the special nature of the problems on Gabriola and are advocating solutions that, in my opinion, will do little or nothing to solve the problems, specifically they see the problem of “stickiness” as being one of drainage, while the real problem is that the material they are using has an extremely low hydraulic conductivity.

The Highway Engineers, Technicians, and other professionals who have prepared the “2006 Standard Specifications” are obviously concerned with the mechanical and physical properties of materials used in road construction, and it is clear to me in reading the documents that some of the potential adverse effects of the geochemistry of the materials have not been given adequate consideration. This is quite possibly because the circumstances on Gabriola are unusual and have not been previously encountered.

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Turning now to the specific complaints, and I will be brief. The essential problems are:

- a. the material that Emcon is using is a very impure limestone (actually mostly granite chips with a generous coating of carbonate) has a too high clay content for Gabriola's environment. This clay is very slow to dry out; in winter, because of the heavy rainfall, and in summer, because many unpaved roads are lined with unlogged forest. The measurement of the "clay" content of aggregate is difficult to do with any reliability because it is so easily washed out. Claims that the material "meets with specifications with regard to fines" (Highway Construction 202.05.01) have to be met with caution because results depend so much on when and where the samples were taken. The ASTM C117 and D75 specifications that Emcon are meant to be following in this regard spell out these difficulties;
- b. carbonate minerals such as calcite, siderite, and magnesite, all of which are present in the Texada Gravel, form with clay a natural hydraulic cement, that is a cement that expands as it sets rather than contracts as does Portland cement. These seals in moisture, which if salt-laden, causes corrosion of the underside of vehicles. There is no mention of the use of carbonate:clay mixtures in your ministry's Highway Construction Standards;
- c. magnesium, which is plentiful in the gravel, forms with silica, which is plentiful in the clay, a coating of magnesium silicate on metal surfaces when hot. Such coatings are a bane in industries using hot water because they are so difficult to remove. These have been observed on Gabriola on the friction surfaces of the brakes of cars. Again there is no mention of magnesium content in your ministry's Highway Construction Standards;
- d. unpaved roads are commonly treated with chemicals to control dust in summer. Dust from unpaved roads is a major environmental, safety, and health concern and a lot of thought goes into its control. What has been completely unforeseen in the present circumstances is that the dust control agents used in past years on Gabriola work by being hygroscopic, that is they attract and retain moisture from the air even when it is not raining, and the combination of these chemicals with clay leads to a mixture that takes forever to dry out.

Although much has been made on the Island of the potential toxic nature of the gravel, I do not personally agree with these assessments. I have not seen the results of any tests that support claims that the material contains unacceptably high levels of arsenic.

Finally, may I add, that in the past, problems of this nature would have been addressed internally within your ministry by your own expert staff, but the new arrangements with contractors potentially hamper and complicate such communication because of contractual (legal) and financial considerations. I respectfully put to you sir that dealing with these problems to the satisfaction of Gabriolans would do much to improve not only their lives, but the lives of your staff who are at the "sharp-end" of the complaints, and do much to earn some respect of involved citizens for your government's policies with regard to road maintenance.

Sincerely

Nicholas (Nick) Doe P.Eng.