Environmental
Appeal Board

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APPEAL NO. 2003-HEA-014

In the matter of an appeal under section 8 of the *Health Act*, R.S.B.C. 1996, c.179.

BETWEEN:	Janet Hardin	**APPELLANT**
AND:	Environmental Health Officer	**RESPONDENT**
BEFORE:	A Panel of the Environmental Appeal Board Don Cummings, Panel Chair	
DATE:	March 25, 2004	
PLACE:	Princeton, B.C.	
APPEARING:	For the Appellant: Richard Bartel For the Respondent: Rob Birtles	

APPEAL

This is an appeal of the September 19, 2003 decision of Ralph Savage, an Environmental Health Officer ("EHO") with the Interior Health Authority, Okanagan Health Service Area (South), to deny issuance of a permit for a sewage disposal system on Lot 7, Block 31, D.L. 128, Y.D.Y.D located at the corner of Nicola and Seventh Street, Tulameen (the "Property"). Tulameen is located approximately 25 kilometres northwest of Princeton, along the south shore of Otter Lake.

The Environmental Appeal Board has authority to hear this appeal under section 11 of the *Environment Management Act* and section 8(4) of the *Health Act*. The Board, or a panel of it, after hearing all the evidence, may decide to vary, rescind or confirm the decision of the EHO. The Appellant seeks an order rescinding the decision of the EHO.

BACKGROUND

The Property at issue in this appeal is an amalgamation of Lots 7, 8, 9 and 10 into a single Lot 7 with an area of approximately 0.55 acres (0.22 hectares). The Property, relatively flat with a slope of less than 0.5%, lies within the 20-year floodplain of the Tulameen River.

On July 28, 2003, Richard Bartel, a Professional Engineer with Point One Engineering (the "Engineer"), submitted an application for a sewage disposal system on behalf of the Appellant. The application specified, among other things:

- a four bedroom house with an estimated daily sewage flow of 1,704 litres per day;
- an alternate sewage disposal system comprising a raised mound;
- a Whitewater Model DF-50-FF package treatment plant with a capacity of 1,889 litres per day;
- soil depth of over 1.2 metres (4 feet) and depth to water table of under 1.2 metres along with the note "floodplain."
- no information was provided regarding percolation tests and a note was added that reads "Design Hydraulic Loading 0.6 gal/ft^2/day."
- distance of the proposed disposal field from Otter Lake was shown at 39.7 metres (130.2 feet).

On September 19, 2003, the EHO issued a Rejection Report denying the application for the following reasons:

1. Seasonal high water table is less than 24 inches from ground surface. We require a min. of 24 inches of good soils above high water mark prior to the placement of fill.
2. The property is subject to flooding.
3. There are concerns with the engineered design submitted (e.g., placement and type of fill, sand filter design, sidewall slope).

On September 30, 2003, the Appellant filed an appeal with the Environmental Appeal Board on the grounds that the "engineered plan of the sewage system was adequate to be granted a permit." She asks that the Board issue a permit for the proposed system.

ISSUE

The sole issue to be addressed in the appeal is whether the proposed system will treat the effluent sufficiently to protect the public health.

RELEVANT LEGISLATION

The *Sewage Disposal Regulation*, B.C. Reg. 411/85 (the "*Regulation*") sets out the general permitting sections, which are produced below.

Permits to construct systems

3 (1) No person shall construct, install, alter or repair a sewage disposal system or cause it to be constructed, installed, altered or repaired unless he holds a permit issued under this section….

…

(3) No permit shall be issued under this section

(a) in the case of construction or installation, until site investigation tests set out in or required by Schedule 1 have been carried out to the

satisfaction of the medical health officer or public health inspector, and either of them is satisfied that, having regard to the provisions of that schedule, the construction, installation and ultimate use of the system will not contravene the Act or this regulation, and…

(4) It is a condition of every permit issued under this section that

…

(e) the construction, installation, alteration or repair complies with the standards for the appropriate sewage disposal system set out in this regulation.

…

(5) The grantor of a permit issued under this section may impose conditions additional to those set out in subsection (4).

…

Alternate methods

7 (1) Where a medical health officer or public health inspector is satisfied that it is impossible for a person to comply with

…

(b) in the case of a conventional package treatment plant system, sections 11, 12 or 18 of Schedule 3

but that the person can comply with all other provisions of the appropriate schedule, he may issue a permit to construct under section 3, containing conditions that he considers appropriate to meet the omitted standards having regard to safeguarding public health.

The relevant portions of Schedule 3 of the *Regulation* titled "Conventional Package Treatment Plant Systems" are referenced in the discussion and analysis below.

DISCUSSION AND ANALYSIS

Whether the proposed system will treat the effluent sufficiently to protect the public health.

The Appellant submits that the Interior Health Authority accepts the Whitewater Package Treatment Plant as an approved package treatment plant. The EHO agrees. The Engineer also set out the reduced level of BOD_5, TSS, and Nitrates that would be discharged into the sand mound after passage through, and processing by, the Whitewater Package Treatment Plant. The EHO agrees that those levels can be achieved by the proposed system. Thus, there is no dispute about the quality and effectiveness of the proposed package treatment plant. The question is whether the proposed design for the raised mound will provide sufficient additional treatment for the remaining discharge.

In his Rejection Report, the EHO provided three reasons for rejecting the system: less than 24 inches of "good soil" above the high water mark prior to the placement

of fill; the property is subject to flooding; and concerns regarding the placement and type of fill, sand filter design and sidewall slope.

Regarding the sidewall slope, the EHO contends that the slopes of the fill are too steep and that, in the event of a flood, the integrity of the fill and subsequently that of the mound may be jeopardized. The Engineer counters that he can amend his design to satisfy any of the EHO's concerns.

The Panel believes that the issue of sidewall slope, although important, can be resolved through discussions and consultation, and by itself should not form the basis for rejection of the permit unless agreement cannot be reached. Of more concern is the viability of the mound itself given the high water table and the likelihood of flooding.

The Appellant acknowledges that the Property is below the 20-year flood level as shown on the provincial floodplain mapping of the Tulameen River at Tulameen (Drawing No. A5294-2, Sheet 2). In the drawings issued for construction, and in his written submissions, the Engineer shows the following property elevations:

- grade elevation of the property at 779.18 metres geodetic;
- 20-year flood elevation at 780.2 metres geodetic;
- 200-year flood elevation at 780.7 metres geodetic.

On behalf of the Appellant, the Engineer applied for a permit to construct a conventional package treatment plant system as set out under Schedule 3 of the *Regulation*. Schedule 3 sets out the specific construction and installation standards for conventional package treatment plant systems.

However, since some of those Schedule 3 standards could not be met (specifically, section 11 which deals with depth of native soil to the ground water table, and section 12 which deals with percolation rates) the EHO considered that application under section 7(1)(b) of the *Regulation*. This section allows the EHO to exercise discretion and issue a permit for a package treatment plant system that fails to comply with sections 11, 12 or 18 of Schedule 3, provided that the "person can comply with all other provisions" of the schedule and that the system will ultimately safeguard public health.

Relevant to this appeal are sections 11 and 12 of Schedule 3 that reads as follows:

Schedule 3 – Conventional Package Treatment Plant Systems

11 A conventional absorption field shall not be located in an area where an impervious layer of soil or bedrock, or the ground water table, are less than 1.2 m [4 ft.] below the ground before it has been artificially disturbed by placement of fill, excavation or otherwise.

12 A conventional absorption field shall not be allowed where the percolation rate of the soil exceeds 30 minutes per 2.5 cm [1 in.] ….

In his written submissions, the EHO states:

> To my knowledge, floods on this property have occurred in recent years: 1992, 1996 and 2002. During a site inspection of this property in June 2002, I had to walk through water to get to the test hole,

> which was located in an area of about 4 metres in diameter above surrounding water. The test hole had water in it to within 2 inches of the surface opening.
>
> Soil mottling would indicate seasonal high water of between 2 inches and 6 inches from the surface, with regular flooding of the property.

The Engineer does not dispute this statement. Rather, to mitigate the problems with soil depth and percolation, the Engineer explained that he designed a sewage disposal system that includes placement of approximately 312 cubic metres of sandy silt fill covering an area measuring approximately 24.4 metres by 9.5 metres. The elevation of the top of the fill would be at the flood construction level – namely 780.7 metres. Flood construction level is the design level for dykes and other structures that is determined by adding a freeboard allowance to the 200-year return period flood level.

On top of this fill, the system design requires the construction of a sand mound through placement of ASTM C-33 sand to a depth of 600 millimetres (two feet), thereby raising the elevation to 781.3 metres. The design incorporates the placement of infiltrators comprising part of the pressure distribution system on top of the sand, then placement of more sand and, finally, topsoil or organic native fill.

The Engineer testified that the percolation rates of both the fill and the sand mound will be controlled through specified compaction criteria resulting in percolation rates, he suggests, between 8 to 10 minutes per inch.

In support of his design, the Engineer referred the Panel to the Capital Health Region's "On-Site Sewage Disposal: Guidelines" for sand mounds using C-33 standard sand. The guidelines set out certain design criteria that the Engineer contends he has satisfied. In response, the EHO argues that the guidelines are specific to southern Vancouver Island and are not appropriate to the Property, which is located in the interior of the Province - a completely different climatic zone.

The Panel agrees with the EHO. In addition, the Panel notes that the guidelines do not refer to construction on a floodplain and appear to be appropriate to sites with a minimum soil depth. The guidelines read, in part:

> This standard [the sand mound construction guidelines] is to be utilized on existing parcels of land where there is at least **30 centimetres (12") of unsaturated porous natural soil above an impervious layer**, and where a minimum of 45 centimetres (18") of C 33 standard sand is to be used. [emphasis added]

Clearly, there is not 30 centimetres of unsaturated porous natural soil on the Property.

The Engineer also submits that his system design complies with section 4.6 of the Ministry of Health's *Policy On-Site Sewage Disposal* (the "Policy"). The *Policy* sets out guidelines both for the interpretation of the *Regulation* and for the exercise of

discretion. Section 4.6 reads:

4.6 Floodplain Sites

...

On floodplain sites where dyking is not available, as a condition of permit under Section 3(5), the finished grade of disposal fields should be above the 20-year flood level. It is suggested that approximately 2 feet of elevation enables the sewage disposal system to withstand the physical impact of flooding and protects the groundwater table if the flood is extended over a period of time.

The Engineer states that he has, in fact, more than two feet of receiving soil to treat sewage effluent because:

1. He has designed the top-of-fill elevation to the 200-year flood event instead of the lower 20-year flood event – a difference of 0.5 metres.
2. He has included an allowance for freeboard. (Freeboard typically ranges between 0.3 metres if instantaneous peak flows govern and 0.6 metres if mean daily peak flows govern.)

The Engineer submits that, whereas the EHO normally requires four feet of unsaturated soils to treat the effluent, his design provides five feet of receiving soil (the sand mound and that portion of the fill above the 20-year flood event). The Panel notes that the Engineer's calculation is dependent upon the freeboard allowance used in establishing the 200-year and 20-year flood events, which he did not specify.

The EHO argues that section 6.1 of the *Policy* is pertinent to the appeal. Section 6.1 reads, in part:

6.1 Consideration

...

Alternate systems

...

To accommodate the owner of an existing lot, an alternate system shall be considered.

The following criteria apply to the omitted standards as set out in … Schedule 3 for soil depth … and percolation rate.

Soil Depth

It is generally accepted by all health jurisdictions throughout North America that a property must have some natural, unsaturated soil above an impervious layer, bedrock or water table to ensure that the on-site sewage disposal system has a comparable life expectancy to that of a conventional system. Most American jurisdictions require a depth of 24 inches.

To meet the requirements of a proposed alternate system, the natural soil on the site must be acceptable and to a depth considered adequate to attenuate

> the effluent and thus prevent ground/perched water contamination and/or result in the creation of a health hazard.
>
> Historically the soil depth requirement in British Columbia has been established as 18 inches. Recent technical information indicates that this requirement may not be sufficient.
>
> (A.) Consideration should be given to increasing this depth when one or more of the following conditions are encountered:
>
> ...
> - percolation rate faster than 15 minutes per inch
> - rapidly porous soil over an unconfined aquifer,
>
> ...
> - small lots (less than 2 acres),
>
> ...

The Panel recognizes that the standards for raised mounds, *per se*, are not addressed in either the *Act* or the *Regulation*, but that section 7(1)(b) of the *Regulation* permits the EHO to exercise discretionary powers in limited circumstances, as discussed above. If section 7 does not apply to this type of system at all, the Panel notes that section 3(3)(a) of the *Regulation*, the general permitting section, would apply (see for example: *Denise Jeffery et al v. Environmental Health Officer* (Appeal No. 00-HEA-006/007/009, June 28, 2000)(unreported); *Gair v. Environmental Health Officer* (Appeal No. 2000-HEA-030, May 9, 2001) (unreported)). In either case, the Panel is of the view that raised mounds may be permitted as long as the EHO, or the Board on appeal, is satisfied that the public health – the overriding concern of the *Act* and *Regulation* - is protected.

Clearly, section 4.6 of the *Policy* supports construction of a sewage disposal system in a floodplain, provided that certain conditions are satisfied. Section 6.1 of the *Policy* provides further guidance to the EHO, when exercising discretion, regarding the criteria that should be satisfied and the issues that should be considered when evaluating such a system.

The Panel recognizes that both the *Act* and *Regulation* set out mandatory requirements, from which there can be no deviation. The Engineer must comply with these requirements to obtain approval for construction of a sewage disposal system. However, in those situations where the EHO can exercise discretion, the Panel believes that it is incumbent upon the applicant for a permit to provide information and design analysis in support of the application if the EHO, and the public, is to have confidence that the proposed system will protect the public health.

The Panel finds that the Engineer's approach to the design of this system has been one of simple compliance with a policy designed to assist the EHO in the exercise of his discretion. The *Policy* provides guidance to the EHO by setting out certain standards and conditions for consideration, such as soil depths and flood elevations. It is not law and it is *not* a formal design guideline that an applicant simply follows in order to obtain a permit: complying with the *Policy* does not guarantee a permit.

There are many other factors to be considered when evaluating whether a system will protect the public health.

In this case, the Engineer did not offer any technical evidence that could be evaluated in order to determine whether his design would likely protect the public health. Instead, he testified that he has designed 19 raised mound systems, three of which have been in floodplains. He also claims that there is a "similar type of sewage treatment system installed (installed after Nov. 2000) and operational at Hillside Road and 6th St, Tulameen….," which is between 50 and 100 metres distant from the Property. The EHO countered that the soils on the other property are significantly different with mottling noted in test holes at depths ranging from 22 to 26 inches.

As the Board has often noted, each application must be considered on its own merits. Thus, because a raised mound system has been constructed nearby does not mean that construction of a raised mound is appropriate on the Property.

In effect, the Panel is being asked to approve this permit application because it was designed by a professional. However, the Engineer admitted that he is not an expert in the field of geotechnical engineering. The Panel believes that what is called for in this application is input from a specialist specifically qualified and trained in soil identification, hydrogeological and biochemical principles. The Panel's particular concerns about the design include, but are not limited to, the following:

- integrity of the fill under flood conditions;
- percolation rates;
- effluent breakout under certain conditions (e.g. flood, freezing temperatures); and
- effluent monitoring.

The Panel recognizes that, "what is called for is a balancing of probabilities and a scale of protection reasonably related to the nature of the threat." (see *Christina Lake Development Ltd.* v. *British Columbia (Ministry of Health, Director)* (1996), 19 B.C.L.R. (3d) 47 (B.C.C.A.), at para. 40). In the Panel's view, when the safety of the public health is at issue, more supporting evidence is needed in order to be satisfied that the system will safeguard public health, particularly when the system is proposed within a known floodplain.

Having considered all of the evidence, the Panel finds, on a balance of probabilities, that the public health will not be protected should the application be approved.

DECISION

In making its decision, the Panel of the Environmental Appeal Board has carefully considered all evidence and arguments provided during the hearing, whether or not they have been specifically reiterated here. Under section 8(4) of the *Health Act*, the Environmental Appeal Board or a panel of it, after hearing all the evidence, may confirm, vary or rescind the ruling under appeal.

For all of the reasons set out above, the Panel is not satisfied that the ultimate use of the proposed sewage disposal system will protect the public health.

The appeal is dismissed.

Don Cummings, Panel Chair
Environmental Appeal Board

April 13, 2004