

## 2 Existing Situation

### 2.1 Water Supply

The existing water supply system serving the Ross subdivision and Punakaiki Village is sourced via an intake weir from a small river to the north of the Ross subdivision. The raw water passes through a fissure in the rock before being collected adjacent to SH 6. The water is filtered and disinfected with Ultra Violet Light at a treatment facility above the Ross Sub-division. There are three original concrete storage tanks at this location and one new plastic storage tank. The reservoirs have a total capacity of 90 m<sup>3</sup>.

A portion of the treated water is fed to a storage tank adjacent to Hartsmount Place that serves the Ross Sub-division, whilst the majority is gravity fed to Punakaiki Village. There is an additional storage reservoir tank situated in the campground at the northern end of the village.

During the peak period there is significant demand on the water supply system. The Council reported that the water supply is utilising almost the whole flow of the source. On one occasion, over a period of a couple of days, it was reported that the water source diminished during the daytime and was insufficient to serve the area during peak demand conditions, with the source appearing to recharge itself during the night.

The current grading of the water supply system as documented in the Drinking Water Register 2003 is Grade Eb (the reticulation grading is to the 1993 DWS). The Council carry out weekly testing of the existing water supply. There have been several recorded instances of E-coli being detected from the current system serving the Ross Sub-division and Punakaiki Village.

A surface water take from a small creek that runs above Dolomite Point supplies the Department of Conservation (DoC), Wild Coast Café, and Punakaiki Crafts at Dolomite Point. The water is gravity fed to Dolomite Point via a filter tank and a storage reservoir before serving the properties.

Properties to the south of Dolomite Point, including the Punakaiki Rocks Hotel and Hydrangea Cottages also obtain their water supply from a creek. The Punakaiki Rocks Hotel filter the water then treat it using Ultraviolet light, and collect and treat rainwater. Some of the treated water is pumped back across SH 6 to a reservoir tank where it gravity feeds to the motels associated with the hotel. The quantity of water available from the creek was reported as being limited.

### 2.2 Wastewater

Properties at Punakaiki treat and dispose of their wastewater through septic tank systems or package plants. The Department of Conservation has built a new facility for treating wastewater from the public toilets at Dolomite Point, which produces a high quality effluent that is discharge to ground.

As part of the work to date, discussions with local residents, business owners and iwi have taken place.

It has been reported<sup>1</sup> by local residents that septic tanks are failing to cope with the excessive demand placed upon them during peak tourism periods, and that the worst affected area is around the junction of Owen Street and SH 6, although there were also reports of odour problems along the beach area close to Punakaiki Village.

## 2.3 Consultation

Following the lodging of the TDSS application with the Ministry of Tourism, a public meeting was held at Punakaiki. It was reported that the meeting was attended by ten ratepayers and that:

- the ratepayer portion of the costs was out of reach especially since the construction of the sea wall
- there was a reluctance to decline the subsidy because it was only a matter of time before issues with wastewater management arose
- there may be other wastewater scheme options which would result in reduced costs.

As part of a review carried out by MWH, meetings or interviews were held at Punakaiki and elsewhere with commercial and residential ratepayers and iwi. Summary points are that:

- there was interest in the sewerage scheme by all those contacted (no one spoke against it)
- interest in a scheme was strong in some cases because the limited capacity of an existing on-site system is a constraint on business development and the cost of upgrading or renewing the on-site system would be large
- interest in a scheme was low, in some cases because a large investment had been made in an on-site system (with an associated reluctance for spending more on a public scheme)
- interest in a scheme was strong in some cases because of the benefits of not having to operate and maintain an on-site system
- a water supply scheme was considered more important in some cases because the current water supply is limited at times (and consequentially poses a risk to business) or the quality of the water is poor and additional costs are incurred buying bottled water or treating water on the premises
- some expressed concern about the proposed location of the wastewater treatment plant (in National Park and adjacent to a river) and a discharge of treated wastewater into the Pororari River.

The West Coast Regional Council reported that the discharges from wastewater treatment systems at Punakaiki are not monitored and that complaints about systems or discharges have not been received.

Similarly, the Crown Public Health reported that it had not received any complaints about wastewater treatment systems or discharges.

Whilst there are some reports of issues with existing on-site wastewater systems<sup>2</sup>, there is no evidence that a major problem exists at present. However, many small communities have experienced problems with on-site systems, particularly when there is a change from predominantly summertime holiday occupation to full time occupation or more intense land use (i.e. higher site occupancies as a result of subdivision, motels etc). Such communities exist in regions that include the Bay of Plenty, Hawke's Bay and Northland.

Problems that will result in public health and aesthetic issues include:

<sup>1</sup> GHD Ltd, Preliminary Design Report January 2006

<sup>2</sup> GHD, Preliminary Design Report, January 2006

- overflowing soil soakage areas because of clogged soil soakage systems, rising groundwater levels, or hydraulically overloaded soil soakage systems
- foul odours from on-site systems, such as septic tanks or package plants, often as a result of malfunctioning or overloading
- contaminated groundwater adversely affected surface waters (e.g. Pororari River).

Problems that will or may result in development limitations include:

- lack of land for on-site system extensions (noting that the area of land required for effluent disposal is directly proportion to the quantity of wastewater)
- high cost of more compact, high effluent quality on-site systems
- high regulatory compliance costs should regular sampling and testing and annual warrant of fitness requirements be imposed.

Key drivers in any decision about whether or not to invest in a sewerage scheme are:

- public health and aesthetic issues that exist
- risk of public health and aesthetic issues in the future.

Whilst the first of these drivers appears not to exist, it is considered that the second driver is significant because of the iconic pancake rock feature at Punakaiki, the high and growing tourist numbers and the commercial interest in providing facilities for the tourists (e.g. more accommodation and meals).

Discussions with local businesses have indicated that some are being constrained by or have the potential to be constrained by limited on-site treatment and disposal capacity. A sewerage scheme has the potential to:

- enhance land development opportunities by removing on-site systems from individual properties and releasing the land that these occupy, particularly because on-site systems are land intensive and more so when land disposal facilities are not sited in free draining sandy soils
- provide economies of scale in cost both for the development of a community wastewater treatment and disposal system and for the operation, maintenance and monitoring of such a system (i.e. typically the costs per property are lower in a communal system than for individual on-site systems in a "Greenfield" situation; however in Punakaiki any development cost savings will be site specific)
- relieve individual property owners of responsibilities and costs associated with the operation, maintenance and monitoring of on-site systems, which in some cases are substantial
- lower the overall risks of wastewater system malfunction and consequential public health and adverse environmental effects through an investment in a single wastewater treatment and disposal system than is managed by specialist operators.

When individual property owners have the opportunity to consider whether or not to support a community sewerage scheme, the above factors can be taken account of in individual business cases. However, in some situations, service realities of current systems will only be fully known after an assessment of the condition and performance of these systems.

### 3 Proposed Water Supply Scheme

#### 3.1 Overview

A water supply scheme will comprise:

- Water intake on the Punakaiki River
- Water treatment plant located at the site of the intake
- Water booster pumping station (at treatment plant) and pumping main to a storage reservoir<sup>3</sup>
- Storage reservoir on terrace south of Dolomite Point
- Trunk main to Dolomite Point and Punakaiki village.

The drawing in Attachment A shows the layout of the proposed water supply scheme. The information about the water supply scheme has been obtained from the report by GHD. The proposed water treatment system would be the subject of review under the Drinking Water Assistance Programme.

#### 3.2 Water Supply

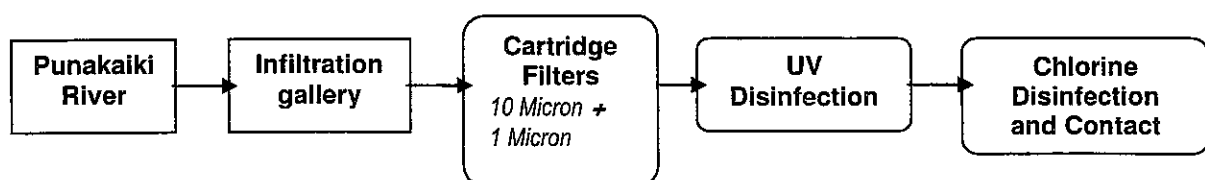
The design capacity (5 Year growth scheme) is for an average daily flow of 362 m<sup>3</sup>.

The water supply would serve Punakaiki and Ross areas without meeting the fire fighting code of practice. A decision to construct the scheme without fire fighting provision in the reticulation would recognise that the nearest NZ Fire Service units are stationed at Westport, some 45 minutes away and would need to put in place a local tanker and trailer pump capability that could make use of the significant storage facilities that would be available. Some storage exists and the new scheme reservoir would be additional. Easy access to the stored water would be provided through standard fire service couplings, and in the event of shortage, the two rivers provide a back up source of water.

Pump stations supplying water to storage have been sized to operate on a 12-hour regime to reduce the run time of the pumps and minimise power consumption. This means that the pumps would pump the 24-hour peak day water flow in 12-hours.

The proposed water treatment processes are shown in Figure 1.

**Figure 1: Water Treatment Option for Punakaiki**



This system would give the required protozoa and E. coli removal required by the NZ Drinking Water Standards 2005.

## 4 Proposed Sewerage Scheme

### 4.1.1 Overview

A sewerage scheme would comprise:

- Sewerage (pipes and pumping station to collect wastewater from properties)
- Wastewater treatment plant located at Dolomite Point at the site of the existing DoC plant
- Land application facility at Dolomite Point adjacent to the wastewater treatment plant.

### 4.1.2 Sewerage

Attachment B shows the layout of the proposed sewers, pumping stations and pumping mains.

### 4.1.3 Wastewater Treatment Plant

The estimated design average daily flow for a Punakaiki sewerage scheme at maximum occupancy is 252 m<sup>3</sup> / day. The proposed wastewater treatment plant comprises:

- screening facility to remove, dewater and package solids in the raw wastewater
- trickle filter and clarifier to treat the screened effluent to secondary standard
- “polishing” of the clarifier effluent in the existing re-circulating granular medium filter prior to discharge to a land application system.

The preliminary design allows for the re-use of components of the DoC WwTP including the pumping stations, the granular medium filter, and the septic tanks for sludge storage.

Important features for a wastewater treatment plant (WwTP) are considered to be:

- appropriate technology for a relatively isolated location (i.e. use technology suited for locally available skills and avoid technology that is dependent on specialists from outside the region)
- minimised sludge production as all sludge will need to be transported to a licensed facility
- minimal risk of odour generation as any WwTP is likely to be close to residential and commercial areas because of the limited availability of land
- minimising energy use.

The WwTP, which serves the Department of Conservation (DoC) field centre and the public toilets, includes these features and it has been demonstrated to be effective in terms of:

- being able to be operated well by local DoC staff
- minimised sludge production (only primary sludge from septic tanks and no secondary sludge), and
- no reports of malodours.

#### 4.1.4 Land Application Facility

The proposed method of disposing treated effluent is by soakage into the underlying limestone at Dolomite Point. This would be achieved using infiltration galleries. The development of infiltration galleries would involve excavation down to the limestone over the required area and backfilling with gravel to form a uniformly level effluent application surface. It is anticipated that appropriately located and designed infiltration galleries would result in a high quality effluent percolating down through the limestone and, in doing so, being further treated, and eventually seeping through underlying joints and fissures to the sea. Rose<sup>3</sup> recorded an anecdotal report of a dye test that showed seepage in a southwest direction from the vicinity of the DoC visitor centre to the sea.

#### 4.1.5 Other matters

##### ***Site Investigations***

The land application of effluent involves detailed site investigations and possible testing in order to demonstrate the feasibility of such a method. Unless the soils in to which effluent would discharge are highly permeable (such as coarse sands and gravels), the soil or rock structure has a finite capacity to assimilate hydraulic loads. The hydraulic loading rate is influenced by the quality of the effluent.

Given the available knowledge about soils and geology at the site, particularly through the work previously carried out for the Department of Conservation prior to it establishing its wastewater treatment and disposal facilities, the option of using infiltration galleries for the land application of effluent is considered potentially feasible.

To demonstrate feasibility, it is considered that investigations would need to include:

- extended topographical survey
- test pits
- infiltration tests, and
- tracer tests to identify subterranean flow directions.

##### ***Existing Wastewater Treatment Plant***

The Department of Conservation has indicated that it would sell the existing wastewater treatment plant (WwTP) infrastructure for the construction cost less depreciation and lease the land on which the plant is situated.

##### ***Resource Consents***

Resource consents will be required for the land on which the treatment plant and land application facility will be built and for a discharge to land.

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<sup>3</sup> Rose, geological report