Environmental Management and Sustainable Policies Plan

Nakia Resort & Dive, Fiji, is an eco resort on the western side of Taveuni Island, the third largest island in Fiji. The resort is surrounded by rainforests and gardens, with a 200-degree view of the Pacific and offshore islands. We provide guests a carefree vacation while ensuring that our practices and theirs leave a light footprint on the earth and do not adversely impact the physical or cultural environment. We have 4 bures (Fijian cottages) accommodating a maximum of 10 guests, a restaurant, and an organic garden on ten acres, on a bluff overlooking the ocean. The nearest town, Somosomo, is about 3 kilometers to the south and has a population of less than 500.

We designed and built Nakia during 2003 – 2007 as a sustainable eco resort relying on the natural energy of water, wind and sun, fresh artesian spring water, and food from our own organic garden. We opened for business in July 2007. We are a member of the International Ecotourism Society, an affiliate of Green Globe, and we strongly support environmental stewardship, community development, and sustainable living. Guests staying with us help support local residents through Nakia's land leases, employment, purchased services, and community projects. We estimate that our environmental concerns and guidelines added approximately 2 years to the timeframe of our building project. We gladly committed ourselves to the extra time, effort, and investment, because we feel so strongly about our commitment to the environment.

Our environmental management plan and sustainability policies address five areas and include specific targets to achieve within the next 2 years, by the end of 2010:

- Energy
- Water
- Recycling and waste
- Land and nature conservation
- Community

Energy

Our greatest achievement to date is our almost total reliance on renewable energy. There is no “grid” on Taveuni Island and biofuels are not available, so we had the choice of designing a system powered by renewable energy or relying on diesel-powered generators. We are helping the environment, and also avoiding the record-high fuel costs (or reduced hours of power) that others on Taveuni face.

We designed and built a hybrid system, with hydro, solar and wind power delivered to a 48-volt system of 1380 Amp-hour solar batteries. Our hydro electric turbine produces 2500 watts, our solar system produces 1600 watts, while our wind turbines produces a maximum of 1000 watts. We then convert the 48 volts to 240 with a 5000 watt inverter to power the resort.

The hydro component is the workhorse of our system, given the head and flow produced by the nearby stream. With our system components, hydro delivers about 70% of the total energy, since it operates 24/7. Our methods for powering the hydro system are addressed in the next section, “water.”

We have a single wind generator powered by the local breeze. We need and have clean wind, situating our turbine above the existing canopy. While the local winds are not constant, our wind turbine delivers an average of 2 amps of the 50 amps produced by our system.

We collect solar power with panels installed on the roofs of two buildings at the resort. Our main pool pump also is run independently by dedicated solar panels. We use 1,600 watt photovoltaic panels for energy production, and an additional 900 watt panel to power the pool pump. We have 2 backup generators available if our alternative energy system goes down. These have not been in use for some time, but are started weekly for maintenance purposes only.

Our micro hydro electric system provides 70% of all renewable energy; solar provides 25%, and wind provides 5%. We measure and monitor energy production and use daily. We can generate between 50-70 kilowatts of power per day, depending upon weather conditions. Our current energy demands are 30-45 kW/day, depending on occupancy load, ongoing projects, etc.

The nerve center of our system is a 5000 watt inverter that receives and measures incoming power from the three sources and directs it to the batteries for storage and use, then converts that 48 volt battery power into 240 volts for resort use. We provide 240 volt power to the resort 24/7. Since we don’t offer air conditioning, the power demands at night are minimal.

In addition to developing and continuously improving a comprehensive system to produce renewable energy, we employ the following energy conservation practices:

- use natural air circulation and fans, not air conditioners
- use natural light during the day
- minimize use of fossil-fuel powered vehicles, machines and equipment
- use “on demand” or solar heating for hot water
- air dry clothes/linens
- wash dishes by hand
- use energy-efficient appliances and electronics
- use low-wattage fluorescent light bulbs
- change linens, tablecloths, napkins upon request
- switch off lights/fans when not in use

Future Goal: We continuously improve our energy conservation and have set the following goal for the end of 2010:

> Reliance on fossil fuel to power vehicles, machines and equipment – reduce from a current level of approximately 3500 liters/year to no more than 2000 liters/year.

To reduce our reliance on generators, we moved one of the catchments for our hydro system to a higher altitude, thereby increasing the pressure and subsequent energy production. To reduce our reliance on fossil fuel to power vehicles, machines and equipment, we have minimized vehicle trips and reduced mowing frequency.

Water

There is no public water supply near Nakia Resort & Dive, Taveuni. Therefore we had to develop our own water source. Before agreeing to purchase this property in 2003, we needed to assure access to a sufficient supply of fresh water.

We discovered a large artesian spring one mile upslope, delivering approximately 60 gallons/minute (4 liters/second), on land owned by a local matagali (clan). After negotiations, we prepared and signed a 30-year lease giving us access to surplus water not used by the matagali. In exchange, we pay an annual fee and installed a fixed plumbing system to the local settlement. We completed this in 2003 and visit the catchment daily to clean, monitor, and maintain it.

When we installed the hydro electric turbine in 2007, we needed more head and flow than that provided by the spring, so we joined water from a nearby artesian stream with water from the artesian spring above Nakia. About 60% of our water comes from the artesian spring and about 40% comes from the artesian stream.

This water is delivered to Nakia through 1500 meters of 3-inch pressure pipe from a 500 foot elevation with 160 psi. We dug the trench for the pipe by hand and buried it to reduce accidents and increase longevity. We have over 130 pounds of static pressure at the resort, requiring a pressure reduction valve on every building and orifice. This blended system produces 60 – 100 gallons per minute which meets the needs of our hydro power system and provides fresh water for the resort and adjacent organic garden. We filter this blended fresh water naturally, employing 1 micron particle filters, charcoal filters, and UV light. To minimize water use in the garden, we carefully monitor rainfall and hand water only when necessary.

We also have four water storage tanks at the resort, with a total of 7,000 gallons capacity, which would meet the basic needs of the resort for 2-3 days, in case of water system failure. We manage our waste water by directing it to septic tanks. We currently do not employ systems to recapture grey water because we have excess water in our system which is returned to the aquifer.

We also employ the following water conservation practices:

- use low-flow faucets and showerheads
- use low-water use toilets
- change linens, towels, tablecloths, and napkins upon request
- use table mats that can be wiped and not laundered
- use biodegradable laundry detergent, dish soap and hand soap
- reduce pool chemicals by 2/3 by employing an ozone generator

Future Goal: By the end of 2010, we plan to achieve the following goal regarding water conservation and waste water disposal:

> Better use of overflow from the hydro system (currently we divert some of the overflow into cisterns for the garden, but this does not use all of the overflow)

Recycling and Waste

There is no garbage pickup or landfill on Taveuni Island. Therefore we must be self-sufficient regarding recycling and waste. We wash and continuously re-use everything possible, including bottles, jars, paper, plastic bags, and so on. We are the only resort on Taveuni that recycles plastic soda bottles, aluminium soda cans, as well as glass beer bottles. We grow much of our own food in our large organic garden and buy any additional food locally and unpackaged. We compost all of our food scraps or feed them to our dogs. We reuse paper then burn it, and we rarely use tin cans or other non-recyclable items. We reduce, reuse, recycle and reinforce these messages with staff, guests and others

In addition, we employ the following practices to minimize waste:

- use durable items, such as cups, glasses, dishes, tableware, storage
- buy fresh and local to reduce packaging and transportation emissions
- purchase in bulk to reduce packaging
- recycle paper, glass, plastic, aluminum
- minimize emissions from fossil-fuel vehicles, machines & equipment
- produce zero waste in the kitchen
- serve our own filtered water in recycled bottles
- use biodegradable cleaning products
- compost organic matter

Future Goals: By the end of 2010, we expect to achieve the following recycling and waste goals: work with local government to develop a public landfill, help to purchase a truck and hire employees to haul refuse for the local community.

Land and nature conservation

We value the local flora and fauna and invest much of our time and energy in developing sustainable practices at the resort and improving the local environment. Specific actions to preserve the local habitat include:

1. Starting an anti-littering program to keep the roads clean, including signs to identify the person or business that picks up the litter;

2. Picking up litter on the local roads eight times/year;

3. Attending Taveuni Farmers' Association meetings to explain to local farmers the danger of monoculture farming practices and the need to diversify crops for food security;

4. Providing free housing, food, transportation and working space for volunteer SPCA vets who come to Taveuni to spay/neuter pets;

5. Showing the Blue Planet DVD to local school children, telling them that when they throw litter on the beach, they can kill animals they see on the program;

6. Helping a nearby village develop a clean source of water and maintaining the catchment (spring house) daily; and

7. Educating local fishermen on species conservation.

In addition, we employ the following land and nature conservation practices:

- minimize tree removal when building
- use no herbicides & pesticides in our garden or on the grounds
- maintain organic gardens as food source for resort
- use biodegradable cleaning products
- minimize external illumination with low wattage bulbs

Future Goals: During 2010, we plan to expand our conservation activities to include the Somosomo Strait and nearby coral reefs, undertaking at least one major project to work with locals to improve practices to protect the ocean and nearby reefs.

Community

Our community includes staff, guests, suppliers and other local residents. Specific actions to support the community include:

1. Developing an improved water system for a nearby village to bring clean water to homes;

2. Belonging to the local Rotary Club and volunteering on local building and health projects;

3. Sponsoring one child from a nearby village, paying all school fees and associated costs. If the child stays in school, we will pay through university. Through our local Rotary, we also help provide scholarships to forty children across the island;

4. Providing information to guests on donating to the Rotary to sponsor a needy student;

5. Accommodating and feeding, at no cost or a very nominal cost, volunteer doctors and nurses visiting to supplement the services of local medical and nursing staff;

6. Participating in an island-wide scabies eradication program that involved 40 volunteers from at least five different countries, lasted 40 days, and cost US$60,000 in donated funds and medicines;

7. Buying crafts and shells from local artisans and selling them in our gift shop;

8. Providing building services to locals at reduced rates;

9. Volunteering for the annual health fair, bringing volunteer medical personnel to Taveuni; and

10. Giving lectures at local schools on the benefits of not littering.

In addition, we:

- hire only local staff
- use local suppliers for at least 80% of our purchases
- re-invest much of resort income locally
- pay well above local prevailing wage
- pay into FNPF, Fiji's local retirement system
- use regular staff meetings to educate staff about sustainable processes throughout the resort, in the garden, with waste disposal, etc
- provide educational awareness programs for staff, guests, suppliers and other members of the local community
- provide sustainable transport to work for staff.

Future Goal: Maintaining our current level of community activities is time- consuming but satisfying. Our goal for the coming 12 months is to continue all of the activities listed above.