

SP87-364

KAHILI ADVENTIST
SCHOOL

Smead®

No. 1536G

HASTINGS, MN

LOS ANGELES-CHICAGO-LOGAN, OH

MCGREGOR, TX-LOCUST GROVE, GA

U.S.A.



Office of the Principal

Kahili Adventist School

LAND USE COMMISSION
STATE OF HAWAII

2008 SEP 23 P 1:5b

TRANSMITTAL

DATE: September 18, 2008

TO: Mr. Ian Costa, Director
County of Kauai Planning Department
4444 Rice Street—Building A, Suite 473
Lihue HI 96766
Attn: Mr. Michael Laureta, Senior Planner

COPIES TO: Mr. Orlando Davidson, Executive Director
State of Hawaii Land Use Commission
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Case Lombardi & Pettit
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Mr. Greg Kamm
Greg Kamm Planning & Management
P. O. Box 1200
Koloa, HI 96756

FROM: Ms. Wanda Lee, Principal
Kahili Adventist School

SUBJECT: **Kahili Adventist School—Agricultural Education Curriculum**
Class IV Zoning Permit Z-IV-87-51
Special Permit SP 87-13, Use Permit U-87-41
LUC Docket No. SP 87-364

Per the requirements of the above-referenced permits for an annual submittal, attached please find an exemplary portion of Kahili Adventist School's agricultural curriculum for the 2008-2009 academic year. The complete 4-year agricultural program (containing 133 Lessons, approximately 700 pages) is outlined in the Table of Contents, and is available upon request. Each of the following Units is an example of a single Lesson.

- Agriculture Curriculum Table of Contents—4 pages
- Unit 2.04: Introduction to Agriculture—26 pages
- Unit 8.04: Soil and Its Effects on Agriculture—13 pages
- Unit 13.05: Forestry and Natural Resources—12 pages
- Unit 18.01: Careers in Agriculture and Agribusiness—10 pages

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Accredited by:
National Council for Private Education
www.kahili.org

Agriculture Curriculum

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Supplemental Materials

- Field Trip Ideas
- Useful Websites
- Web Quests

Agriculture Curriculum

Unit 2: Introduction to Agriculture

Lesson 4: Hawaii's Agriculture

Student Objective

Identify and discuss agriculture areas that Hawaii is, or has been, first in.

Reference

Hawaii Agriculture, <http://hawaii.gov/hdoa/add/hawaii-agriculture-food-products-database>

Hawaii Agriculture, <http://www.alternative-hawaii.com/agriculture/>
<http://www.alternative-hawaii.com/agriculture>

Herren, Ray V. *Exploring Agriscience 2nd Edition*. Albany, NY: Delmar Publishers, Inc.

Lee, Jasper S.; Patrick, Amanda R.; Vaughn, Rosco; Vaughn-Randel, Shelly; and Murphy, Erin. *AgriScience Discovery*. Danville, IL: Interstate Publishers, Inc.

<http://www.ers.usda.gov/stateFacts/HI.htm>

Equipment, Supplies, Materials

<http://www2.ctahr.hawaii.edu/adm/dean/role.pdf> (teacher resource)

Internet access if possible

If available, allow students to access the web site for Hawaii Agriculture.

Handout 7Ag 0.2.1

Kauai Sugar Plantations Document

History of Hawaiian Agriculture Document

Teaching Procedure

Introduction and Mental Set

As the states' largest industry, agriculture can be found in all of Hawaii's counties. Hawaii farmers are able to produce a wide variety of farm commodities due to the mild climate, soil types, and know-how.

1. Be creative in having a dynamic attention getter. As a last resort, bring in several Hawaii products and discuss them. Have some food that is made from taro or macadamia nuts for the students to taste.
2. Have students list all products that are grown in or come from Hawaii agriculture. Discuss these and add products that were missed.

3. Prepare to have local agriculture business representatives or producers tell about how important agriculture is to them and have some locally made products to display.
4. Have students play the mind reader game "Top Ten Hawaii Agriculture Products" located on disc 2 under class starters and games. This can also be done as an additional activity.

Discussion

1. *Question: What three crops rank first in production in Hawaii?*

Answer:

coffee
pineapple
coconut

2. *Question: Hawaii was the first state to cultivate what crop?*

Answer: Sugarcane

3. *Question: Where was the first Sugarcane plantation located?*

Answer: Koloa, Kauai

4. *Question: What were the major challenges associated with the early sugarcane industry ?*

Answer: Shortages of water, limited labor, and lack of markets for their product.

Additional Activities

1. Group students in groups of six. Tell them 1 out of every 6 people will have an agriculture job in Hawaii. Have one student in each group tell of an agriculture related job.
2. Have students discuss why they feel Hawaii has such a rich agriculture background, and why Hawaii needs to continue to develop its agriculture.
3. Have students complete the word search at the end of the lesson.
4. Have students make HI Agricultural Products Gift Baskets
5. Using the "History of Hawaiian Agriculture", students can make, illustrate, and display a time-line for Hawaiian Agriculture.

ACADEMIC CONNECTIONS

Language Arts

Connections in Agriculture Education

Name: _____ Date: _____

Teacher's Note: You may need to provide the students with textbooks, encyclopedias, or Internet access in order to answer some of the questions.

In class you learned that Hawaii is a state with a strong agricultural base. You also learned about the crops that Hawaii produces, such as sugarcane, coconut, and macadamia nuts. Pick one of Hawaii's major crops and explain how it impacts your life. An example could be that you love to drink fresh coconut juice, and, without the coconuts that Hawaii produces, you would not be able to enjoy a cool, refreshing drink on a hot summer day. Answer in complete sentences.

If you could only have one food from Hawaii for the rest of your life, what would it be?

What part of Hawaii does this food come from?

What kinds of recipes can you make from this food?

Ask your classmates what the one food that they love the most is. How many of them chose the same food as you? If so, find out why?

ACADEMIC CONNECTIONS

Science

Connections in Agriculture Education

Name: _____ Date: _____

You learned from this lesson that agriculture is definitely an important business in Hawaii. Agriculture is very diverse in Hawaii also. Its mild climate and varied terrain allow Hawaiian farmers to grow many different crops through much of the year. Using the Internet or other sources, research to find out what Hawaii farmers might be doing throughout the year.

JANUARY –

FEBRUARY –

MARCH –

APRIL –

MAY –

JUNE –

JULY –

AUGUST -

SEPTEMBER -

OCTOBER -

NOVEMBER -

DECEMBER -

Kauai Sugar Plantations

Sugar cane, or Ko in Hawaiian, is a perennial grass that can grow up to 20 feet high. Imported by the original Polynesian inhabitants of Hawai'i the plant was believed to have medicinal properties in addition to its sweet flavor. Once harvested the stalks are ground up and the liquid

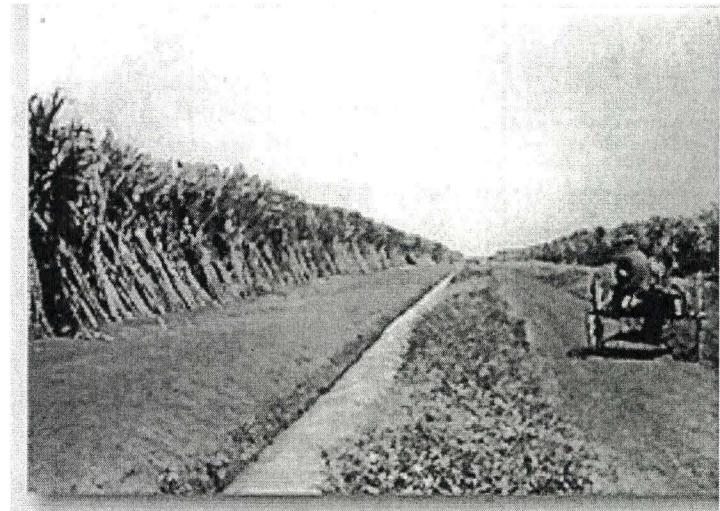
extracted by rollers to obtain juice, which is then slowly boiled down to create raw sugar.



It takes approximately 5 million gallons of water per acre to bring a crop of sugar ready to harvest during a two-year growing cycle. Just 20% of that amount comes from rain so the pioneer sugar planters solved water shortages by building irrigation systems that included aqueducts (the first built on Kauai in 1856), artesian wells (the first in 1879), and tunnels and mountain wells (the first in 1898).

The 1876 Treaty of Reciprocity between the United States and the Kingdom of Hawaii eliminated the major trade barrier to Hawaii's closest major market for its raw sugar and a new industry in Hawaii was born.

The first commercial sugarcane plantation was started at Koloa, Kauai in 1835. Early sugar planters faced a multitude of challenges including shortages of water, limited labor, and due to their isolated location a lack of markets for their sugar.



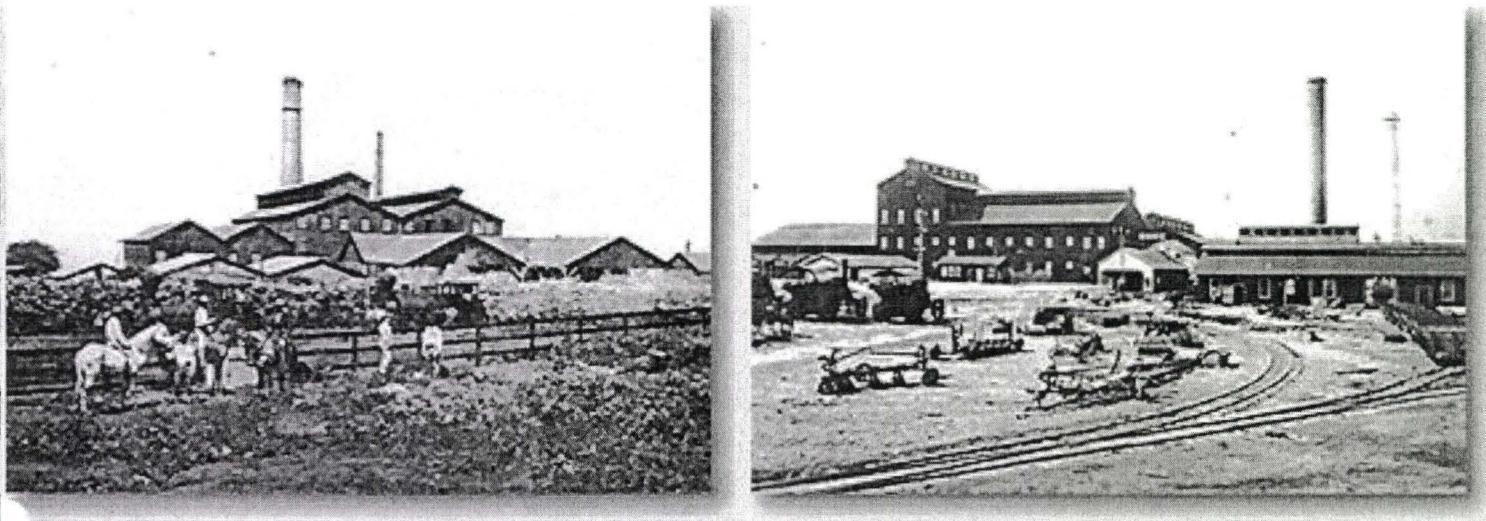
In just 60 short years raw sugar production reached 225,000 tons and by 1932 had grown to one million tons.

As the major commercial enterprise in rural Hawaii the plantations were cities unto themselves employing the majority of island labor force, providing housing, transportation, entertainment and later even electricity to the residents of Kauai through the power generated at their



sugar mills. The first train came to Kauai in 1881 and served the Kilauea Plantation with 3 miles of track and five engines.

For over a century, sugarcane was the state's leading economic activity providing Hawaii's major source of employment and tax revenues. It takes approximately three feet of cane to produce one cube of sugar. On Kauai alone there were over 70,000 acres dedicated to sugar with up to nine major plantations operating across the island at any given time from the Hanalei River to the Mana Plain.



Kauai Sugar Plantations

Gay and Robinson
Established 1889 at Makaweli, Kauai

Grove Farm Plantation
Established 1864 at Lihue, Kauai

Kekaha Sugar Company
Established in 1856 at Kekaha, Kauai

Kilauea Sugar Plantation
Established 1877 at Kilauea, Kauai

Kipu Plantation
Established 1907 at Kipu, Kauai

Koloa Sugar Company
Established 1835 at Koloa, Kauai

Lihue Sugar Plantation

Established 1849 in Lihue, Kauai

McKee Plantation
Established 1877 at Kealia, Kauai

McBryde Plantation
Established 1899 Eleele, Kalaheo, and Lawai, Kauai

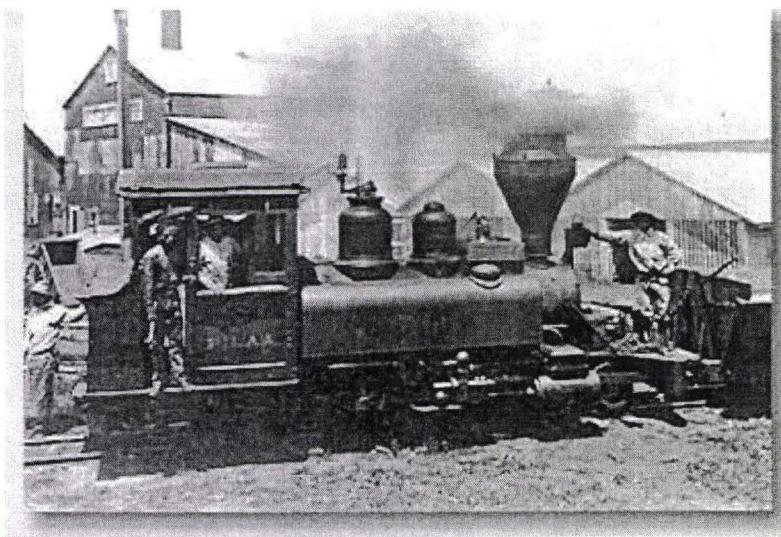
Today there remains only one commercial plantation and mill on the island of Kauai. For an informative view of a working plantation we highly suggest that you take their tour.

Gay & Robinson Sugar Plantation
2 Kaumakani Avenue, Kaumakani
Website: www.gandrtours-kauai.com
Office: open during regular business hours
Mail to: P.O. Box 440, Kaumakani, HI 96747
Phone: (808) 335-2824 Fax: (808) 335-6852
Hours: Monday–Friday 8:00 am–4:00 pm, except plantation holidays

2Ag 2.4

History of Hawaiian Agriculture (Unit 2.4)

It is believed that Hawaii's original settlers arrived here from the Marquesas between 500 and 700 AD. These first visitors to Hawaii brought with them pigs and chickens along with a variety of staple food crops including: Kalo (taro), Ko (sugar cane), Mai'a (banana), Niu (coconut), Uala (sweet potato) and 'Ulu (breadfruit). Journals from the voyages of Captain Cook in 1778 document the trading for food and supplies with the native populations of both Kauai and the Big Island of Hawaii.



After its discovery by western civilization, new crops continued to be introduced into the islands by early settlers from around the world. Well-known Honolulu resident, Don Francisco de Paula y Marin, the Spanish advisor to King Kamehameha I, first

introduced pineapple to Hawaii in 1817 with coffee coming shortly later having been imported from Brazil. Kona's first coffee farm was started just ten years later.

During the California gold rush between 1849 and 1851 Hawaii was an important source of supplies for the miners. Hawaii agriculture boomed with Irish and sweet potatoes, onions, pumpkins, oranges, molasses, and coffee all being grown to be shipped to the West Coast.

While sugarcane had been grown throughout Hawaii for many years it was with the development of the first extensive irrigation system at the Lihue Plantation on Kauai, which included a 10-mile long irrigation ditch and tunnel system, that it became one of the island's first commercially successful sugar operation. Soon many others followed due in part to the reciprocity treaty of 1876 between the Kingdom and the United States which allowed for duty-free export of sugar, leading to a rapid expansion in sugarcane production throughout the island chain.



Over the period between 1889 and 1910 agriculture thrived in the islands. It was during this time that macadamia nuts were introduced to Hawaii and pineapple was first canned commercially in

Kona. The drilling of an artesian well on the dry Ewa, Oahu plains, opened groundwater irrigation of agricultural fields and allowed for even more rapid growth of commercial plantations which included with James Dole's planting of 61 acres of pineapple in Wahiawa.



Surprisingly rice was also an important crop during this period with over 9,400 acres under cultivation and an annual output of almost 42 million pounds - rice was the second largest crop in Hawaii.

By the 1930's nine million cases of pineapple packed by eight canneries on Maui, Molokai, Oahu and Kauai were shipped from Hawaii to points around the world. And sugar cultivation had reached its peak with over 254.562 acres under development. Commercial farming in the islands was a success and plantation companies throughout the territory enjoyed record profits. It was never to be the same.

The years of plantation growth throughout the islands had created a need for workers that could not be filled by the local residents. Contract labor became the way to solve the problems and a long line of migrant workers were brought to Hawaii to work in the fields. They came from the Canary Islands, Puerto Rico, China, Japan and beginning in 1946 the Philippines. A year later the "Great Sugar Strike" took place, when 28,000 ILWU workers at 33 plantations struck, signaling the beginning of a new era.



Hawaii became the 50th State in the union in 1959 and soon after Hawaiian pineapple growers were supplying over 80% of the world's output of canned pineapple. In 1966 things begin to slowly change as pineapple production began to decline and sugar peaked at 1,234,121 tons of raw sugar. By 1970 the number of Pineapple canneries had dropped from 9 to 3 and many smaller sugar plantations began to consolidate or close as it was discovered that these same crops could be produced for less money in other countries. This trend has continued until today when

there exists in Hawaii only two sugar plantations – one on Kauai and one on Maui and two large-scale commercial pineapple operations on Maui and Oahu.

Agriculture in Hawaii in the present day is all about diversification, from tropical crops like macadamia Nuts, banana and papaya along with tropical flowers, to select garden vegetable grown exclusively for the discerning tastes of an ever increasing number of visitors. Currently there are over 5,500 farms in Hawaii that grow more than 40 crops commercially. Our macadamia nut industry represents over 45% of the world's production making it the second largest and Hawaii continues to be the only state in the nation to grow coffee with an annual production of over 7.6 million pounds grown on the islands of Hawaii, Kauai, Maui, Molokai, and Oahu. The plantation days may be long gone but the legacy of commercial farming and agriculture will continue in these islands for many years.

Pre-Contact (prior to 1778)	<p>"Original settlers of Polynesia migrated through South-East Asia and Indonesia across Melanesia, before settling the Polynesian islands from 1000 BC to 500 AD. Hawaii was one of the last island groups to be settled. Archaeological evidence indicates the first Polynesians arrived in Hawaii from the Marquesas between 500 and 700 AD." (From a Guide to Natural History).</p> <p>First settlers to Hawaii introduced pigs and chickens of Asian ancestry. They also bring "Ape (elephant's ear), 'Awa (kawa), 'Awapuhi Kuahiwi (shampoo ginger), Hau Ipu (gourd), Kalo (taro), Kamani (Alexandrian laurel), Ki (ti), Ko (sugar cane), Kou, Kukui (candlenut), Mai'a (banana), Milo (portia tree), Niu (coconut), Noni (Indian mulberry), 'Ohe (bamboo), 'Ohi'a 'Ai (mountain apple), 'Olena (turmeric), Olona, Pia (Polynesian arrowroot), 'Uala (sweet potato), Uhi (yam), 'Ulu (breadfruit), Wauke (paper mulberry)" with them. (From Canoe Plants of Ancient Hawaii.)</p>
1778-1800	<p>1778 Captain Cook brings an English sow and boar to Niihau on his first voyage. Captain Cook observes local chickens on Kauai.</p> <p>1790 Sandalwood export trade starts.</p> <p>1792 The orange brought to Hawaii.</p> <p>1793 The first cattle, originating from California, were introduced by Capt. George Vancouver on his second trip in 1793. On this trip and again in 1794, a total of eight females and four males were landed on the island of Hawai'i. One male and one female died shortly after landing. After the initial importation, King Kamehameha I placed a taboo on the slaughter of cattle, so that by 1830 when it was removed, cattle were very numerous.</p>

1800	<p>1809 The Parker Ranch had its beginnings in 1809, when John Palmer Parker, a sailor from Massachusetts arrived on the islands. He married a Hawaiian princess and began domesticating wild cattle and horses that roamed the Big Island.</p>
1810	<p>1810-1825 Height of sandalwood trade. 1813 Don Francisco de Paula y Marin, Spanish advisor to King Kamehameha I, introduces coffee and pineapple to Hawaii. 18?? John Wilkinson brings 30 of the so-called "Hawaiian coffee" plants from Brazil. This is believed to be the first introduction of this coffee type that was widely planted in Hawaii.</p>
1820	<p>1824 The mango tree brought to Hawaii. 1828-29 H.N. Greenwell plants first coffee plant in Kona leading to the establishment of a coffee industry for Kona</p>
1830	<p>1830 King Kamehameha I's kapu on slaughter of cattle removed due to large population. 1830s Coffee initiated as a commercial crop. 1839 First forestry law in Hawaii passed, restricting the cutting of sandalwood.</p>
1840	<p>1840 Captain Thomas Cummins, a wealthy shipping merchant from England, began raising beef cattle and sheep in Waimanalo. 1846 King Kamehameha III passes a law declaring forests to be government property. 1848 The feudal landholding system was changed to allow fee simple ownership of land by private persons (Great Mahele). 1849-1851 California gold rush brings a boom to Hawaii agriculture; Irish and sweet potatoes, onions, pumpkins, oranges, molasses, and coffee were shipped to the West Coast.</p>

1850	<p>1850 First publication of Transactions of the Royal Hawaiian Agricultural Society.</p> <p>1853 Hogs from Hawaii exported to California during gold rush, price was 4-6 cents per pound</p> <p>1856 The Lihue sugar plantation on Kauai develops the first extensive irrigation system in Hawaii, which included a 10-mile long irrigation ditch and tunnel system.</p> <p>1858 First experimentation with rice, which was an important crop in Hawaii in the latter half of the 19th century.</p>
1860	<p>1860s Drought, a variety of infestations, and labor shortages hinders coffee growth leading to the closures of nearly all plantations in the islands, except for Kona and Hamakua.</p> <p>1862 The U.S. Department of Agriculture is established by President Abraham Lincoln.</p> <p>186?? Claus Spreckels and his brother established the Bay Sugar Refinery in San Francisco, getting their raw sugar from the Hawaiian Islands.</p> <p>1868 First Japanese workers come to Hawaii.</p> <p>1869 First recorded commercial dairy.</p>
1870	<p>1870 First plantings of Eucalyptus on Maui.</p> <p>1870s Water crisis in Honolulu.</p> <p>1876 A reciprocity treaty between the Kingdom and the United States allowed for duty-free export of sugar, leading to a rapid expansion in sugarcane production.</p> <p>1876 "Act for the Protection and Preservation of Woods and Forests", including watershed preservation, passed by Kingdom of Hawaii.</p> <p>1878 The Waimanalo Sugar Company is founded. Rail tracks are laid out and three locomotive engines are brought in to haul cane to the mill and the wharf.</p> <p>1878</p>

	Future Queen Liliuokalani composes "Aloha Oe". The melody was inspired during a visit to the Waimanalo sugar plantation.
1880	<p>1880s-90s Plantings of Eucalyptus and ironwoods on Tantalus and in Nuuanu valley, above Honolulu.</p> <p>1881 William H. Purvis introduces macadamia nuts to Hawaii.</p> <p>1882 John Ackerman and Waldemar Muller canned pineapple commercially in Kona.</p> <p>1885 Captain John Kidwell is credited as being the pioneer of the pineapple industry in Hawaii. He began crop development trials in 1885 when he planted in Manoa, Oahu.</p> <p>1889 The first artesian well was drilled in Ewa, Oahu, ushering in groundwater irrigation of agricultural fields.</p>
1890	<p>1890 Captain John Kidwell plants Smooth Cayenne pineapple near Pearl Harbor. Sold plants to Baldwin on Maui.</p> <p>1890s Strong economies in Europe and America results in rise of market prices for coffee creating a boom for Kona coffee.</p> <p>1892 Hermann Widemann introduces a Guatemalan coffee variety that is more recently referred to as the "Kona typica."</p> <p>1892 Kidwell and John Emmeluth build pineapple cannery in Waipahu.</p> <p>1895 Hawaii Sugar Planters Association (HSPA) founded.</p> <p>1897 150,000 pecks of pineapple exported at value of \$14,000.</p> <p>1898 Alfred W. Eames arrives in Hawaii as one of the original "California Homesteaders" to begin pineapple cultivation. Eames first starts selling fresh pineapple in the year 1900, nearly a century ago. His company eventually became Del Monte Fresh Produce (Hawaii) Inc.</p> <p>1898 Japanese coffee farmers establish the Kona Japanese Coffee Producers Association in an effort to improve processing and market a higher value product.</p> <p>1899 Kunigoro Yokoyama plants 100 acres of the Guatemalan coffee variety in</p>

	Kamalumalu, Kona.
1900	<p>1900 James Drummond Dole purchases 61 acres in Wahiawa and began experimenting with pineapple</p> <p>1901 James Drummond Dole incorporates the Hawaiian Pineapple Company and begins growing fruit on 60 acres in Wahiawa.</p> <p>1901 Hawaii Agricultural Research Station (UH) established on outskirts of Honolulu.</p> <p>1902 Byron Clark founds Tropical Fruit Company (for pineapple).</p> <p>1903 Commercial egg production starts on Oahu with 1000 imported layers on one operation.</p> <p>1903 Territory of Hawaii, with the backing of the Hawaii Sugar Planters' Association, establishes a Board of Agriculture and Forestry, predating the USDA Forest Service by one year.</p> <p>1904 Hiring of first Territorial Forester (Ralph Hosmer); creation of first forest reserves to protect upper watershed areas. Forest reserves managed by fencing, feral animal elimination, and reforestation with native and exotic tree species.</p> <p>1905 Dole packs 125,000 cases of pineapple.</p> <p>1906 Hawaiian Pineapple Co. builds Iwilei Cannery.</p> <p>1906 Oahu Rail and Land Company agrees to link the railroad line between Wahiawa and Honolulu.</p> <p>1907 Dole builds Iwilei cannery for pineapple.</p> <p>1907 Establishment of the College of Agriculture and Mechanic Arts. Name changes to College of Hawaii in 1909 and to University of Hawaii in 1919.</p> <p>1907 Rice planting expands to 9,400 acres and output reaches almost 42 million pounds - rice is second largest crop in Hawaii.</p> <p>1909 Japanese laborers strike against Oahu sugar plantations.</p>
1910	1910-14 Pineapple research carried on by pineapple companies and University of

	<p>Hawaii.</p> <p>1910 Japanese coffee farmers make-up 80% of the total farming population in Kona.</p> <p>1910 Discovery of Mediterranean fruit fly stops exports of avocado and other products from Hawaii.</p> <p>1911 Ginaca machine patented by Dole employee Henry Ginaca to process pineapple.</p> <p>1911 Introduction of the Solo papaya from Barbados and Jamaica, on Oct. 7, 1911, (accession no. 2853) by Gerritt P. Wilder (of Honolulu) resulted in the complete transformation of the Hawaiian papaya industry. This small papaya, which was named Solo in 1919, replaced the earlier large-fruited forms, and by 1936 the Solo was the only variety grown commercially.</p> <p>1912 Hawaiian Pineapple Packers' Association research station formed which became the Pineapple Research Institute.</p> <p>1914 Pineapple Packers Association establishes alliance with HSPA for research.</p> <p>1919 University starts an extension service without federal funding (see 1928).</p>
1920	<p>1920 Hawaiian Homes Act established. Federal government set aside 200,000 acres of land state wide for homesteading by Hawaiians with 50% or more native blood. Author of the bill was Prince Jonah Kuhio Kalanianaole, Hawaii delegate to Congress. First homestead area settled was in Kalamaula on Molokai. Agricultural lots were established in Hoolehua, Molokai.</p> <p>1923 Pineapple Packers Association establishes own experiment station.</p> <p>1924 Labor riots at Hanapepe kill 16 workers and 4 policemen (July).</p> <p>1925 Ernest Van Tassel leases 75 acres on Round Top in Honolulu (Nut Ridge) and begins a macadamia nut orchard, Hawaii's first macadamia nut farm.</p> <p>1928 Establishment of the Federal-Hawaii Cooperative Agricultural Extension Service, with funds from the Smith-Lever Act.</p> <p>1929 Depression leads to coffee bust; many debt-ridden coffee farmers declare bankruptcy.</p> <p>1929 Ernest Van Tassel negotiates with Bishop Estate to obtain 100 acres of land</p>

	<p>in Keahoe Mauka for planting more than 7000 macadamia nut trees resulting in the first macadamia nut farm on the island of Hawaii.</p>
1930	<p>1930 Nine million cases of pineapple packed by eight canneries.</p> <p>1931 Ernest Van Tassel establishes a macadamia nut processing factory on Puhukaina Street in Kakaako; nuts sold as Van's macadamia nuts.</p> <p>1931 Twenty-five percent of the area of Hawaii in established Forest Reserves, both public and private lands.</p> <p>1933 Sugar production peaks with 254,563 acres planted.</p> <p>1934-1941 Civilian Conservation Corps reforestation efforts plant an average of two million trees per year in the forest reserves.</p> <p>1937 W.W. Jones and J.H. Beaumont reports in "Science," the first successful grafting of macadamia nuts that paved the way for mass production.</p> <p>1938 Debt ridden coffee farmers negotiate with American Factors (AMFAC) for an adjustment. Coffee farmers get a chance at a new start with American Factors reducing debts to 2% of original debts.</p> <p>1938 Pineapple Packers Association experiment station name changed to Pineapple Research Institute of Hawaii (PRI).</p>
1940	<p>1945 Hawaii swine population peaks at 90,000 head.</p> <p>1946 6000 Filipino workers immigrated to Hawaii for jobs in sugar and pineapple.</p> <p>1946 "Great Sugar Strike" - 33 plantations struck -- 28,000 ILWU workers (September 1).</p> <p>1947 Hawaiian Pineapple Company consolidates its outlying camps by designing plans for Whitmore Village.</p> <p>1947 Newly organized unionized pineapple workers conducts their first labor strike.</p> <p>1947 Oahu farmers meet in October for the first time leading to the creation of the Hawaii Farm Bureau that was incorporated in December 1950.</p> <p>1948</p>

	<p>First major all-island study of the characteristics of vegetable and fruit farms undertaken.</p> <p>1949</p> <p>Territorial legislature creates Industrial Research Advisory Council to sponsor and finance studies, many have been in the area of diversified agriculture.</p> <p>1949</p> <p>Castle and Cooke plants first grafted macadamia nut trees (January 3). By the early 50s, the company's orchard contained more than 3,000 macadamia nut trees.</p>
1950	<p>1950</p> <p>Hawaii Farm Bureau Federation officially starts.</p> <p>1952</p> <p>Frozen pineapple juice concentrate hits the shelves for the first time.</p> <p>1953</p> <p>The territory establishes its first public-owned irrigation system in Waimanalo.</p> <p>1953</p> <p>Mid 1950s-Castle and Cooke adds a new brand of macadamia nuts called "Royal Hawaiian," which is credited with popularizing the nuts in the U.S.</p> <p>1955</p> <p>Pineapple production peaks with 76,700 acres planted.</p> <p>1955</p> <p>Establishment of a cooperative program between the U.S. Department of Agriculture National Agricultural Statistics Service and the Agricultural Cooperative Extension Service at UH to provide agricultural statistics from a single government office.</p> <p>1956</p> <p>Edward T. Fukunaga and John Beaumont publish research from the Kona Experiment Station revolutionizing coffee pruning throughout Central and South America.</p> <p>1957</p> <p>The Hawaii Farm Bureau becomes a member of the American Farm Bureau Federation.</p> <p>1957</p> <p>USDA Forest Service experiment station established for forestry research in Hawaii; eventually becomes the Institute of Pacific Islands Forestry.</p> <p>1957-58</p> <p>The coffee industry peaks in production with 15 million pounds of green coffee beans.</p> <p>1958</p> <p>90-day ILWU sugar strike results in the closures of sugar mills at Kohala, Kahuku, Kilauea, and Ewa Beach.</p> <p>1959</p>

	<p>Establishment of the Sunset Coffee Cooperative and Pacific Coffee Cooperative to rebuild Kona's coffee industry.</p> <p>1959</p> <p>With statehood, federal funds became available for the development and growth of Hawaii's agricultural industries with funding for programs such as farm credit, natural resources, and statistical services.</p>
1960	<p>1960s (early)</p> <p>Hawaii pineapple growers supply over 80% of the world's output of canned pineapple.</p> <p>1961-1968</p> <p>Plantations of potential commercial timber species established in Waiakea forest reserve and Laupahoehoe forest reserve on the island of Hawaii.</p> <p>1962</p> <p>Cooperative Statistical program between U.S. Department of Agriculture National Agricultural Statistics Service and the Cooperative Extension Service at UH transfers to the Hawaii Department of Agriculture.</p> <p>1960s (mid)</p> <p>Kona Farmers Cooperative, previously known as Sunset and Pacific Coffee Cooperatives gets Superior Coffees in Chicago to purchase its entire crop at a premium price resulting in the construction of a roasting plant in Honolulu.</p> <p>1965</p> <p>CTAHR trials for Illinois Foundation Seeds and Cornnuts, Inc. led to establishment of Molokai Seed Service on 5 acre of Yoshida farm on Molokai for 'winter corn breeding'.</p> <p>1966</p> <p>Pineapple production begins to decline.</p> <p>1966</p> <p>Molokai Seed Service founded and the first winter corn seed nursery planted. This endeavor evolved a year later into the Hawaiian Research / Holden's organizations on Molokai. This organization serviced Cargill / PAG until 1997.</p> <p>1966</p> <p>Peak sugar production with 1,234,121 tons of raw sugar.</p> <p>1968</p> <p>Molokai Irrigation System completed.</p> <p>1968</p> <p>ILWU pineapple workers strike for 61 days.</p> <p>1968</p> <p>Trojan Seed Company establishes a corn research farm at Kihei, Maui, which evolved through ownership by Pfizer Genetics, and DeKalb to its present Monsanto Global Seeds business.</p> <p>1968</p> <p>Pride Seeds / NK establishes a corn research farm on west Kauai. This has</p>

	<p>evolved through ownership by NK, and Sandoz Seeds to its present Novartis business formed by the merger of Ciba Seeds and NK in 1996.</p> <p>1968</p> <p>Pioneer Hi-Bred, International establishes a corn research farm on west Kauai.</p> <p>1969</p> <p>Establishment of the HCIA (Hawaii Crop Improvement Association) with help from CTAHR to bring together agencies, institutions and individuals involved in the production of seed.</p>
1970	<p>1970s</p> <p>Pineapple cannery numbers go from 9 to 3.</p> <p>1971</p> <p>Establishment of the Papaya Administrative Committee, a federal marketing order regulating Hawaii-grown papayas (May 15).</p> <p>1972</p> <p>Funk's G Seed Company establishes a corn research farm on Molokai, which evolved through ownership by Ciba Seeds and merger with NK to relocate to the Kauai facility.</p> <p>1973</p> <p>Pineapple Research Institute of Hawaii (PRI) station closes and pathology and nematology research transferred to University of Hawaii.</p> <p>1974</p> <p>Pineapple task force formed for R&D planning.</p> <p>1974</p> <p>About 9,000 ILWU sugar workers strike for 39 days (March 9).</p> <p>1974</p> <p>About 6,000 ILWU pineapple workers on Oahu, Maui and Lanai strike for 21 days (April 7).</p> <p>1974</p> <p>Visions to become largest producer of macadamia nuts leads C. Brewer & Company, Ltd. to purchase Castle & Cooke's operation at Keaau.</p> <p>1975</p> <p>The establishment of the state's first agricultural park at Pahoa.</p> <p>1976</p> <p>Del Monte expands into the produce business with national distribution of fresh Hawaiian pineapple. This transition is accomplished with a focus on direct airfreight, or Jet Fresh, shipments.</p> <p>1977</p> <p>1st Pineapple Industry Analysis completed.</p>
1980	<p>1982</p> <p>Formulation of the Ginger Commodity Group Association.</p> <p>1982</p> <p>Ginger industry hits 100 acres of production for the first time, raising 3.6</p>

	<p>million pounds at a record high price.</p> <p>1983</p> <p>Del Monte Corp. folds Hawaii pineapple canning operations (September 3).</p> <p>1983</p> <p>C. Brewer & Company, Ltd., becomes largest producer of macadamia nuts in the world.</p> <p>1984</p> <p>Del Monte opens a new Hawaiian pineapple juice concentrate processing plant in Kunia, Hawaii.</p> <p>1984</p> <p>Garst Seed Company establishes a corn research farm at Kunia, Oahu.</p> <p>1986</p> <p>Pineapple Research Institute of Hawaii (PRI) breeding program closes and pineapple germplasm transferred to National Germplasm Repository in Hilo.</p> <p>1986</p> <p>CTAHR begins a state-wide coffee variety trial or experiment launching a new era in Hawaii's Coffee Industry, the next year one of the cooperators Kauai Coffee (A&B) begins planting the largest irrigated mechanized coffee plantation in the world.</p> <p>1987</p> <p>Enactment of the State Water Code sets precedence on the allocation of water with the shutdown of a plantation irrigation system.</p> <p>1989</p> <p>Del Monte introduces Fresh-Cut Chilled Hawaiian Pineapple. This is the first nationally distributed, fresh-cut, refrigerated fruit item. It is tailored for both the convenience oriented consumer market and for the foodservice market; containing no additives and preservatives.</p> <p>1989</p> <p>Hawaii Forest Industry Association founded.</p>
1990	<p>1991</p> <p>6th Pineapple Industry Analysis completed.</p> <p>1992</p> <p>Ginger industry suffers major losses (65-75%) due to bacterial wilt and nematodes; losses estimated at 9 million pounds.</p> <p>1992</p> <p>Dole Packaged Foods Co. closes Lanai plantation (October).</p> <p>1992</p> <p>Dole shuts Iwilei Cannery (December).</p> <p>1992</p> <p>Hawaii Tropical Forest Recovery (Federal) Act enacted resulting in the development of a detailed action plan that brings the complexity of forestry into a comprehensive and coordinated planning process (October).</p> <p>1994</p> <p>Hamakua Sugar Co. harvests last crop (September 30).</p>

1994
The Waiahole Ditch Contested Case sets the process for allocation of water by the state's Water Commission.

1995
Hilo Sugar closes.

1995
Oahu Sugar closes (April 9).

1995
First papaya shipment to Chicago for quarantine treatment employing irradiation (April 5).

1995
First shipment of foliage potted plants to Japan (November 28).

1996
Ka'u Sugar closes (March 27).

1996
Waialua Sugar closes (October 4).

1997
Cargill purchases the Funk's G/ Ciba facility and establishes its seed research business independently on Molokai.

1997
Hawaiian Research expands and establishes a farm at Haleiwa, Oahu.

1997
Farm value of diversified agriculture surpasses \$300 million mark for first time.

1997
Private, commercial eucalyptus plantations begin on former cane lands in Hamakua, Hawaii Island.

1998
Debut of transgenic papayas -- Rainbow and SunUp -- resistant to the Papaya Ringspot Virus (May 1).

1998
Ginger industry records a record year with production of 18 million pounds.

1998
Federal rule change to allow commercial export of certain varieties of green bananas -- Brazilian, Valery, Williams -- to the U.S. Mainland and Guam (November).

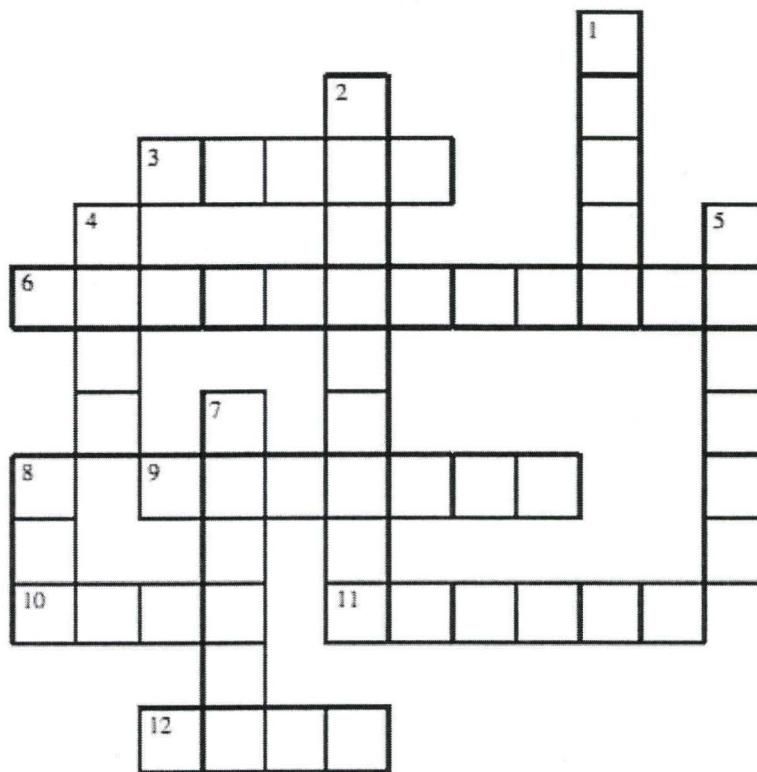
1998
Hawaii's banana production reaches a record breaking 21 million pounds; a 53% increase from the previous year.

1999
Last sugar harvest in Lahaina, Maui (September 12).

1999
There are over 5,500 farms in Hawaii. In 1954, there were less than 3,700 such farms.

2000+	<p>Today we grow more than 40 crops commercially. That's compared to only 28 fruit and vegetables grown commercially in 1954.</p> <p>The state acquires ownership of the Waiahole Ditch guaranteeing a steady source of irrigation water at an affordable price allowing for growth of diversified agriculture in Central and Leeward Oahu (July 9).</p> <p>Pioneer expands and establishes a seed processing plant at Waialua, Oahu.</p> <p>The seed business has grown since 1966 to a \$27 million industry which is still growing and ranks seventh among diversified agricultural industries. In addition to corn, crops now include soybeans, sunflower, and sorghum.</p> <p>Hawaii's macadamia nut industry is the second largest in the world with 45% of the world's production.</p> <p>Hawaii continues to be the only state in the nation to grow coffee. Currently Hawaii produces 7.6 million pounds of green coffee annually with production on the islands of Hawaii, Kauai, Maui, Molokai, and Oahu.</p>
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Hawaii's Agriculture



ACROSS

- 3 Where Kauai's first irrigation system was developed
- 6 The man who first introduced pineapple to Hawaii
- 9 Where the majority of Hawaii's taro is grown
- 10 Sweet Potato
- 11 Percent of the world's pineapple crop produced in Hawaii in 1959
- 12 Taro's Hawaiian name

DOWN

- 1 There are 5,500 _____ in Hawaii
- 2 Another name for Ko
- 4 Hawaii's first coffee plantation
- 5 Hawaii is the only US state to grow this crop
- 7 Fruit grown in Hawaii by the name of Mai'a
- 8 Hawaiian word for coconut

Summary

Conclusion

Hawaii has a long history in agriculture. Even though agriculture is not as big a business as it once was, it is still a very important part of our way of life.

Evaluation

If further evaluation is needed a written quiz may be given

Possible Field Trips

1. Taro Ko Farm - (808) 335-5586
2. WT Haraguchi Farms Inc - (808) 826-6202
3. Poipu Farms Packing House - (808) 246-4883
4. Hawaiian Farmers of Hanalei - (808) 826-6192
5. M & H Kaneshiro Farm Inc - (808) 742-1771
6. Esaki's Produce - (808) 822-7722
7. KS & S Kakimoto Farm - (808) 639-1720
8. Dante's Family Farm - (808) 635-9032
9. Boy Akana Farms - (808) 828-1746
10. Hawaiian Medicinal Herb Farms - (808) 821-2877

Word Search

S	J	F	R	C	Y	V	S	J	T	O	S	E	L	J
R	N	A	H	R	O	O	Y	O	B	C	E	N	E	S
E	G	A	I	U	Y	T	M	F	P	C	L	I	M	T
U	Y	A	C	B	R	M	T	I	G	A	P	W	Y	U
Z	D	R	E	E	Y	H	A	O	A	G	P	S	S	N
I	M	A	B	I	P	R	M	Z	N	O	A	B	P	A
S	N	H	R	C	S	G	G	E	F	T	R	P	S	E
S	G	V	A	G	R	I	C	U	L	T	U	R	E	P
E	I	O	U	L	W	N	P	O	T	A	T	O	E	S
N	R	P	H	J	E	E	K	H	H	T	D	T	N	O
H	Q	M	Q	K	I	L	L	E	C	A	N	F	J	Z
A	T	Q	C	A	L	T	H	S	A	E	X	V	L	R
Y	C	I	I	X	K	T	R	G	E	H	G	J	H	I
M	H	M	U	O	Z	A	R	H	P	W	B	R	H	N
C	I	I	B	E	S	C	H	A	W	B	I	A	Z	S

AGRICULTURE

APPLES

CAN

CATTLE

CHICKEN

COTTON

DAIRY

EGGS

HAY

HOGS

PEACH

PEANUTS

PECANS

POTATOES

RYE

SOYBEANS

SWINE

TOBACCO

WHEAT

Agriculture Curriculum

Unit 8: Soil and Its Effects on Agriculture

Lesson 4: Basic Soil Science

OBJECTIVES

1. Describe what soil is and where it comes from.
2. Describe the four major components of soil.
3. Explain how soil is classified.
4. Describe the chemistry of soil.

REFERENCES

EQUIPMENT, SUPPLIES, MATERIALS

Jars
Plastic bottles
Water
Sand
Silt
Clay
Spray polyurethane

TEACHING PROCEDURE

Introduction and Mental Set

Ask students, what is soil? Most will probably say that it is dirt, but explain that soil is not dirt. Dirt is something that you may think is filthy or unclean, but do we think soil is filthy or unclean. No, soil is an important part of the earth's surface and provides nutrients for plants to grow and produce. Also ask students why some soil is called "fertile"? Allow students to respond and then explain that soil is termed fertile when it has all the right materials (Mineral particles, organic matter, air, and water). This type of soil produces good crops.

Discussion

1. What is soil and where does it come from?

Soil is a material that forms the crust or covering of the earth. It comes from the breakdown of rocks and rotting dead creatures. Soil is formed very slowly.

2. What are the four major components of soil?

Soil contains minerals, organic matter, air and water, and living organisms.

The appropriate amount for each is 45% mineral, 5% organic matter and 50% air and water.

A. Minerals: The minerals found in soil are formed from the breakdown of rock. Minerals help provide nutrients, thus it provides a place for roots to grow.

B. Organic Matter: Organic matter found in soil comes from the death and decay of any living creature. Organic matter may also come from animal waste. **Humus- organic matter that has decayed to the point it is not longer recognizable.** Humus and organic matter is easily found in woods under leaves. Organic matter helps provide carbon, hydrogen, and oxygen to the soil and this same matter helps soil hold water and nutrients.

C. Air and Water: Air and water is held in tiny spores within the soil. Both of these are vital for any living organism in the soil. The amount of water and air vary, but the more water, the less air and the less water, the more air. Both water and air are important to plants. Plants need water to grow and for photosynthesis. Plants need air to respire.

D. Living Organisms: Bacteria, fungi, single cell protozoa, nematodes, and earthworms, prairie dogs, and groundhogs are all found in soil. All of these work together to build the soil.

3. How is soil classified?

The U.S. department of Agriculture uses a classification system known as the Comprehensive Soil Survey System. Soil texture, structure, profile and color are used to group the soil.

A. Soil Texture: This is the size of particles in the soil. Large particles are considered sand, medium-size particles are considered silt, and the smallest particles are clay. The size of the particles determines the ability of soil to absorb and hold water. The texture of the soil is based on the percentage of each particle in a soil sample. The best texture of soil is known as **loam**. Loamy soil has equal parts of sand and silt and a smaller amount of clay. Loam soil is optimal because it allows passage of air, prevents compaction and it retains water. Sandy soil will lose water too fast and clay soils are tight and won't allow for air and water and penetrate as well.

B. Soil Structure: This is based on the size of particles and how these particles are grouped together. The combination of sand, silt, and clay is known as peds or aggregates. The grade of peds depends on the degree to which it stays together. Four grades include: structure less, weak, moderate, or strong.

C. Soil Profile: this is a way of looking at a cross section of soil. Soil has layers known as horizons. The uppermost layer is known as topsoil or the A layer. The B layer is known as subsoil. The C layer is below the B layer and above the bedrock. Bedrock is the underlying solid rock.

D. Soil Color: The color of soil comes from minerals and organic matter. The color of soil indicates the quality of the soil. Dark brown or black soil indicates soil that is high in organic matter; therefore, the darker the soil the higher the amount of organic matter. Soils that are red or yellow indicate soil that is high in iron compounds. Soils that are gray usually have poor drainage and soils that are white have low nutrient levels. Soils may also have a spotted appearance color. This is called mottling. Mottling is due to variability of moisture in the soil.

4. What is soil chemistry?

The most important of soil chemistry is pH and nutrients. pH is the acidity or basicity and is based on a scale from 1 to 14, 1 being the most acidic and 14 being the most basic; therefore, 7 is neutral. Most soils are in a range between 4 and 9. Most plants will do well in an acidic soil with 6.6 be the optimum pH. Nutrient level is the second chemical aspect. There are three groups known as organic elements, major elements, and minor elements. Organic elements are carbon, hydrogen and oxygen. The major elements are nitrogen, phosphorus, and potassium. The minor or trace elements are other elements required in small amount for plant growth.

Experiment #1:

The differences in soil particles. You will need to divide the class into groups of two or more. Pass out Handout #1 so that students can follow the directions for the experiment.

Experiment #2:

Soil air. Divide the class into groups of two or more. This experiment will observe soil air. Pass out Handout #2 to each group so that students can follow the directions for the experiment.

ACADEMIC CONNECTIONS

Science

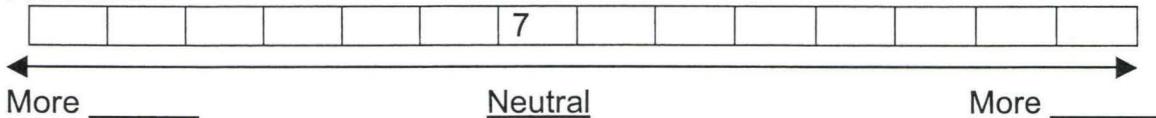
Connections in Agriculture Education

Name: _____ Date: _____

In this lesson we learned that the most important part of soil chemistry is pH level. Let's learn about the pH scale.

1. Fill in the following scale using the numbers 1 through 14. Fill in the blanks below the scale telling which is more basic and which is more acidic.

PH Scale



2. Based on the pH scale presented above fill in the following table: Notice that the acid base cell is blank. It is up to you to tell whether the product is an acid or a base!

Product	PH	Acid or Base?
Lemon juice	2	
Coke	3	
Soda water	4	
Baking soda	8.5	
Hand soap	10	
Topsoil	6.0	
Human Tears	7.4	

**The more H⁺ ions in a solution, the lower the pH value!

**The fewer H⁺ ions in a solution, the higher the pH value!

3. From the information in the table above, which product has the most H⁺ ions and why? _____

4. From the information in the table above, which product has the fewest H⁺ ions and why? _____

ACADEMIC CONNECTIONS

Language Arts

Connections in Agriculture Education

Name: _____ Date: _____

Date: _____

Select one of the following topics related to soil science and write a poem with at least eight lines on the topic. Remember the elements of poetry, such as rhythm, rhyme, stanza, and figurative language.

- What soil is and where it comes from
- Four major components of soil
- Classification of soil
- Soil chemistry

ACADEMIC CONNECTIONS

Mathematics

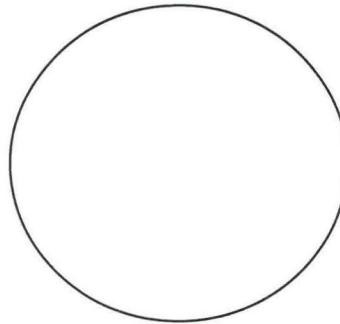
Connections in Agriculture Education

Name: _____

Date: _____

Complete the following problems.

1. Soil is made up of mineral content, air and water. The ratio of these components is very important. Good soil usually has about 50% mineral content, 25% air, and 25% water. Complete the pie chart below illustrating this soil ratio.



2. Have you ever made a mud pie? When you make a mud pie, you drive the air out of the soil. When you drive the air out, you change the composition of the soil. If half of the air in the soil is removed while making a mud pie, what would the new soil composition be (assuming it was 50% mineral content, 25% air, and 25% water before)?

Percent mineral content? _____

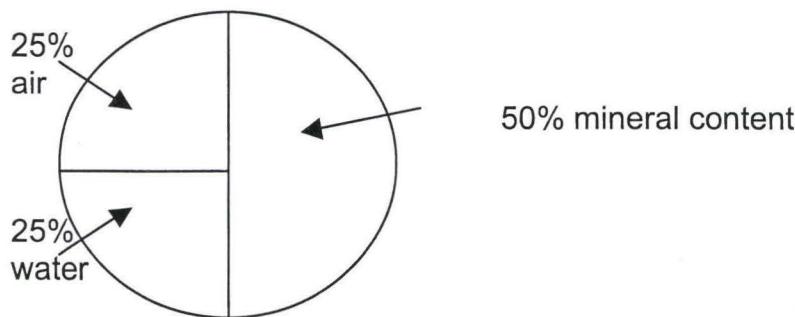
Percent air? _____

Percent water? _____

3. Since you now know the affect that compaction has on soil composition, why would it be unwise to till or plow soil that has just been saturated by a recent rain?

Answers:

1.



2. $\frac{25}{2} = 12.5\% \text{ air}$ 50% mineral content (this will not change)

25% water + 12.5% from lost air = 37.5% water

50% mineral content, 12.5% air, 37.5% water

3. Tilling or plowing the soil while it is saturated will destroy the soil structure, compact the soil, and drive out air. This makes the soil environment less favorable for plant growth. When the soil dries it will be hard -- like dried mud pies!

SUMMARY

Conclusion

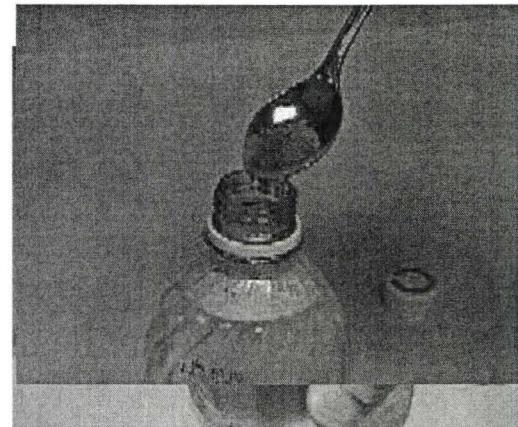
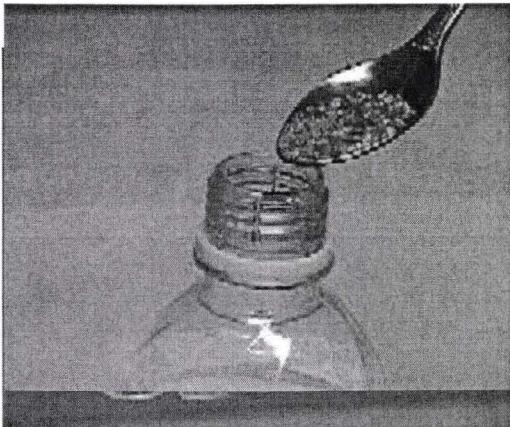
Students will learn where soil comes from, the four basic components, how soil is classified, and soil chemistry.

Evaluation

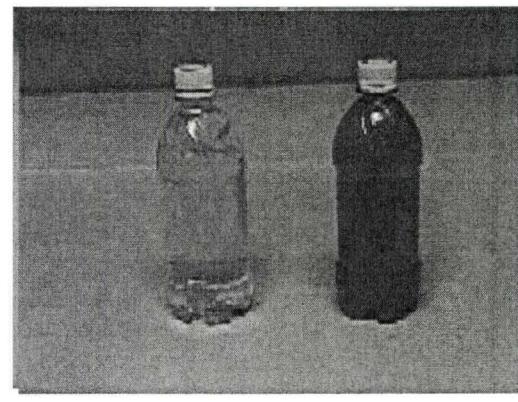
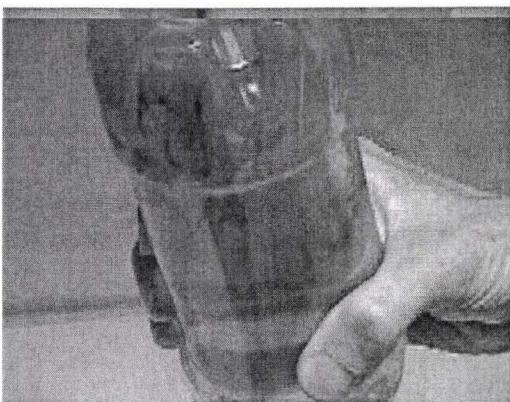
Written Quiz

Handout #1: <http://soils.usda.gov/education/resources/lessons/psd.htm>
Step1: Find glass jars or plastic bottles. Fill with water:

Particle Size Demonstration



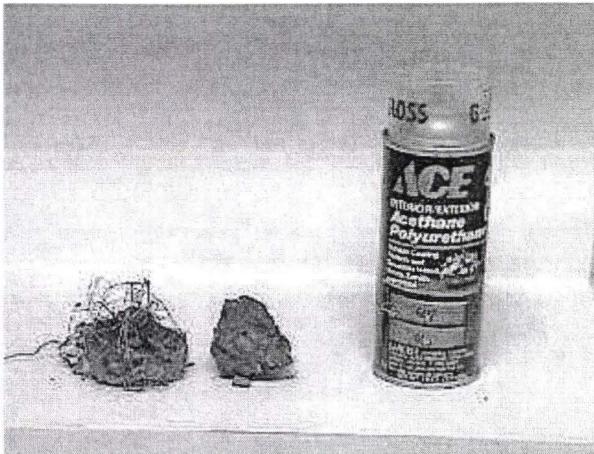
Sand will settle rapidly while silt and clay will settle more slowly.
Shake up the bottles and observe how long it takes for the particles to settle.



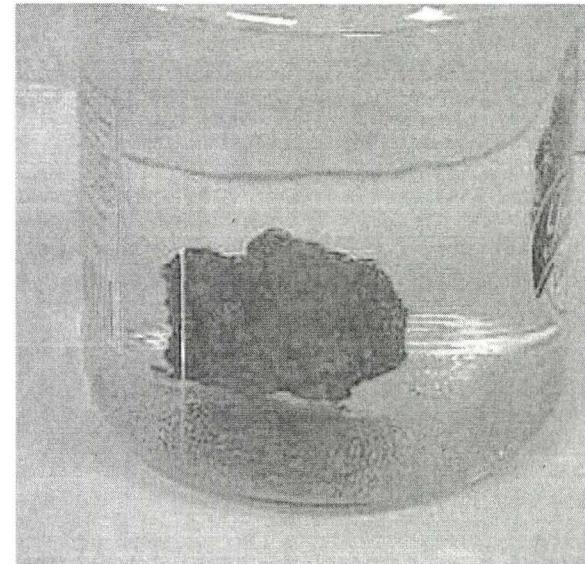
Observe the difference in the clarity of the water.
Sand vs. Silt & Clay

Handout #2:

Soil Air



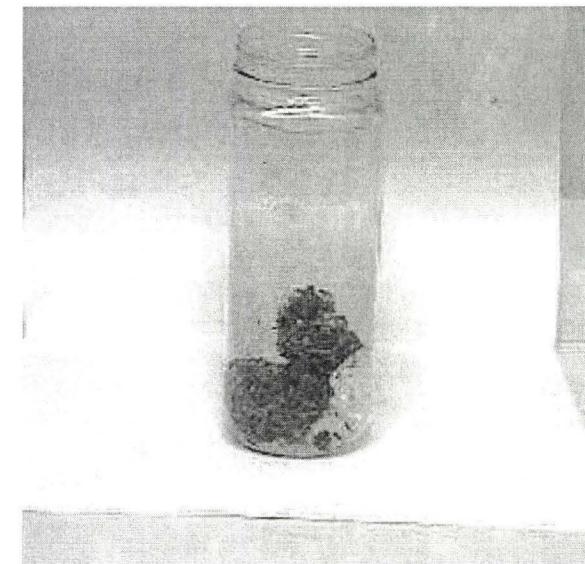
All it takes is a can of spray polyurethane and soil clods to demonstrate soil air.



Spray the clod and wait a minute or two before dropping the clod in a jar of water.



Drop the clods gently, and watch the bubbles.



Air will bubble from some clods for up to 20 minutes or more.

Activities

Activity 1: Dirt Discovery

Dirt Discovery is a science project that teaches kids about soil composition. There's more to dirt than you think! Find out what it's made of.

What You'll Need:

Waterproof table covering
Jar with lid
Spoon
Dirt
Pitcher of water
Paper towels
Magnifying glass

How to Conduct the Dirt Discovery Project:

- Step 1: Cover your work surface. Fill a jar halfway with dirt. Add water nearly to the top of the jar. Put the lid on, and tighten it securely.
- Step 2: Shake the jar vigorously for a half a minute, and then set it down. Let the jar stand until the dirt and water settle. The soil will settle into layers.
- Step 3: Observe the layers in the jar, and see what you can tell about them. How many layers are there? Which layer is made of the biggest particles? Which is made of the smallest? Can you guess why?
- Step 4: To further examine the different layers and what they are made of, you can sort out the soil materials and examine them. Use a spoon to skim off the objects floating in the water. Place them on a paper towel.
- Step 5: Then carefully pour off the water on the top and scoop out the grains of the next level onto another paper towel. Do the same if there is another level.
- Step 6: After each layer has been placed onto towels, they can be examined with the magnifying glass. What else can you tell about the different layers after further examination?
- Step 7: You can also do this experiment with dirt you have collected from different areas and compare your findings. Draw pictures of each jar full of soil after you have shaken it and the dirt has settled to make picture comparisons.

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Activity 2: Soil Shakes

Soil shakes are also a great way to teach kids about various soil types. For each sample of soil, fill a clear container two thirds full of water. Add enough soil until nearly full, cover tightly, and shake. Let kids observe their 'shakes' over the next few days as the soil particles settle into layers. The larger particles, like sand, will remain at the bottom while the smaller ones will be closer to the top.

A great way to explain each of the soil layers is to create edible soil for the kids, also known as dirt cups. Not only does this make learning about soil fun, but it's tasty too!

Ingredients

Milk

Instant vanilla and chocolate pudding

Whipped topping,

Chocolate sandwich cookies (1/2 crushed)

Clear plastic cups, and some gummy worms and sprinkles

Pour 2 cups of milk into separate bowls, adding pudding mix into each and blending well. Add half of the whipped topping to each bowl, mixing well. Place whole cookies in the bottom of each cup, to represent bedrock.

Next, add some of the crushed cookies to mimic the parent material. The subsoil is lighter colored so the vanilla pudding goes here. Add the topsoil, which is represented by the darker chocolate pudding.

Finally, top it off with sprinkles and gummy worms to represent organic matter and living organisms found in soil. Refrigerate 1 hour before eating.

Activity 3: Using Compost to Improve Soil

Invite kids to explore the different plants adapted to each soil type. Ask them how they could improve the conditions of each. For example, you can change the texture of various soils by adding compost.

Compost enhances the physical aspects of soil, which produces healthier soil, and healthy soil produces healthy plants. Compost is made up of organic materials that break down in the soil and encourages the presence of earthworms.

Composting materials can include things like leaves, grass clippings, garden waste, and kitchen scraps.

Create small compost bags that kids can observe using re-sealable plastic bags. Put air holes in the bags and let them fill the bags with moist soil and kitchen scraps.

Close the bags up and observe for a few weeks, shaking them now and then. When the compost is ready, let the kids use it to grow plants of their own by adding seeds and watching them sprout.

Activity 4: Down and Dirty

Down and Dirty is a science project that teaches kids about all the creatures that live in the dirt. Soil contains microscopic animals that breathe.

What You'll Need:

Garden soil
Jar with a lid
Limewater (available at a drugstore)
Small container

How to conduct the Down and Dirty experiment:

- Step 1: Drop a large handful of garden soil into the bottom of a big, empty jar. Pour some lime-water into a small container. Note what the lime-water looks like.
- Step 2: Set the container of lime-water, uncovered, inside the large jar so it rests on top of the soil. Tightly screw on the lid of the large jar, and leave it undisturbed.
- Step 3: In 2 or 3 days, look at the lime-water to see if it has changed in any way.



Agriculture Curriculum

Unit 13: Forestry and Natural Resources

Lesson 5: Introduction to Forestry

OBJECTIVES

1. Define forestry.
2. Discuss the history of forestry in the U.S.
3. List and describe the most common forestry products.
4. List the employment opportunities in the forestry field.

REFERENCES

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Pathfinder Honors Manuel. NAD. Silver Springs, MD.

Lee, Jasper S.; Patrick, Amanda R.; Vaughn, Rosco; Vaughn-Randel, Shelly; and Murphy, Erin. *AgriScience Discovery.* Danville, IL: Interstate Publishers, Inc.

Morgan, Elizabeth M.; Lee, Jasper S.; and Wilson, Elizabeth. *AgriScience Explorations.* Upper Saddle River, NJ: Prentice Hall Interstate.

Project Learning Tree. 1987. Washington, DC. The American Forest Council

Project Wild. (<http://www.projectwild.org/>) (pdf on resource CD)

http://www2.ctahr.hawaii.edu/forestry/Data/Common_Trees_Hawaii.asp

EQUIPMENT, SUPPLIES, MATERIALS

TV/Video Projector/DVD
Tree Power Point
Resource CD (HI Native Trees) 80 pages
Handouts13AG 5.1 through 13Ag 5.3

TEACHING PROCEDURE

Introduction and Mental Set

Have students make a list of as many forestry products as they can think of in five minutes.

Discussion

Discuss with your students the history of forestry and the uses of forest products. If possible invite someone with the forestry industry into your classroom to talk about the forestry industry in Hawaii and how important the forestry industry is to our economy. Discuss with your students the following forestry terms and careers.

1. **Question:** *How many acres of trees are planted annually in the United States?*
Answer: Tree planting on all ownerships total approximately 2.6 million acres annually. This annual planting roughly equals the size of the State of Connecticut. Compare this annual planting to 2.3 million acres of trees planted under the ten year Civilian Conservation Corps tree planting program (mid-1930's to mid-1940's) and to 2.2 million acres under the entire Soil Bank Program (1956 to 1961).
2. **Question:** *What is happening in Hawaii to reforest the islands?*
Answer: see 13AG 5.3
3. Using the internet, research the different products made from wood in Hawaii.

Forestry Vocabulary

forest management: the care of forests to achieve maximum production and other benefits.

forestry: The science and art of growing trees and making them into products.

Prescribed fire: Fires that are set on purpose and managed by a forester in order to clear out under growth to prevent larger more destructive forest fires.

Native Forest: Areas that were seeded naturally.

Commercial forest: Areas where the trees were intentionally planted.

Urban forestry: Planting of trees in towns and cities.

Selective cutting: When specific trees are harvested.

Clear cutting: Removing all trees from a tree stand at one time.

Thinning: The selective cutting of trees to allow other trees to grow easier.

Pulpwood: Wood that is harvested for making pulp. The pulp is then used to make paper, paper products, and other products. Some products made from pulp include sponges, sausage casings, plastics, shatterproof glass, and many other products.

Careers in the forestry industry

Arborculturist: The scientific care of shrubs and trees in cities and towns, as opposed to a silviculturist which works tree stands in forest and tree farms.

Computer Specialist: Maintains land databases for forestry consulting firms and provides reports to forester and forestry firms. College degree required.

Forester: Studies plants, trees, and wildlife. May establish forests, assess tree growth, investigates pest problems and selectively harvest trees. College degree required.

Logger: a person who harvest trees as logs. Involves using power and hand equipment to cut and trim logs, and skid them through the woods and loads them on a truck to be delivered to a mill.

Silviculturist: Studies and manages tree stands to increase production. Controls forest establishment, composition, and growth. College degree required.

Soils Specialist: Studies soils and creates soil maps for the forestry industry, farmers, and others. College degree required

Tree nursery worker: Grows seedlings, conducts research manages tree nursery. College degree required.

Additional Activities:

- Earn Pathfinder Tree honor
- **Red Celery Test:** Mix red ink with water in a jar or clear glass vase. Stand a stick of celery in it and watch and see what happens over a 24-48 hour period. The stalk and leaves should turn pink. We can compare this activity to how water is carried throughout a tree.
- **Bark Rubbings:** You will need a sheet of paper and a big, dark colored crayon. Lay the paper on top of the bark of a tree's trunk and gently rub all over the paper with the crayon. Try to get rubbings from different types of trees and compare the results. Students can keep a notebook of their findings.
- **Pressed Leaves:** Collect leaves from as many different types of trees as you can. Place the leaves on paper and press them between two heavy books. You may want to pile additional books on top of each other to add extra weight.

- **Leaf Scars:** Collect branches with leaf scars from different trees. Compare and discuss the differences. Make an exhibit or bulletin board display of all the different leaf scars the students find.
- **Parts of the Trunk:** To show the parts of the trunk, take different sizes of cans and paper tubes and color them to reflect the phloem, cambium, xylem and heartwood. Place the tubes around each other to build your own tree trunk.
- **Plant a Tree:** Plant a tree to celebrate Arbor Day or to simply celebrate the importance of trees in our environment and our world.
- **How Old Are You?:** Find a log or a tree that has been cut down at the trunk and count the rings. Each ring represents one year of life for the tree. Compare the age of the tree to the students.
- **How Big Is a Cord of Wood:** Use a tape measure or yardstick and string to outline how much space in the classroom would be taken up if you were to store a cord of wood. Students can hold the string from end to end to demonstrate the length, width, and height of a cord of wood. You can then call your local home supply store and investigate the cost of a cord of wood.
- **What Do I See That's Been Made from a Tree?:** Brainstorm and list everything in the classroom that has been made from trees. You will be surprised how many things we use each and every day that come from trees. The students can do the same activity at home.
- **Tree Mural:** Make a wall mural of the four seasons of a tree.
- **Postage Stamp:** Design a postage stamp to celebrate trees or the seasons. Place the stamps together on the wall to create a mural or quilt.
- **Pencil and Paper (Both of which have come from trees!):**
 - Write a poem or story about trees or the seasons.
 - Write about your favorite tree.
 - Think about what the world would be like without trees. Write a story or poem. Choose one type of tree and research its origin, description, where it grows, and how it is used.
- **To Touch a Tree:**
 - (need blindfolds) Students should be in pairs. One student should be blindfolded. The blindfolded student should carefully be led to different trees by their partner.
 - The blindfolded student should carefully feel the textures of the leaves, needles and bark of the tree.
 - Once the blindfolded student removes the blindfold, they should see if they can identify the trees, needles and leaves that they felt while blindfolded.

- After a few minutes, the students should switch places and repeat the exercise.
- Back in the classroom, the students should be encouraged to write about their experience.
- ***Shapely Trees***
 - Students should cut out a variety of different sized geometric shapes (triangles, rectangles, squares, etc.)
 - Students should take a walk around the wooded areas of the schoolyard and try to match the shapes with similar patterns that they find in nature.
 - Back in the classroom, students could recreate the patterns that they saw with their shapes, drawing details as necessary. A class bulletin board or mural could be created.

Hawaii's Native Trees: Identify and label the trees around the school. Note which trees are native to Hawaii. Use 13Ag 5.1 and 13Ag 5.2. More pages like these are on the resource CD (HI Native Trees.pdf) Also use http://www2.ctahr.hawaii.edu/forestry/Data/Common_Trees_Hawaii.asp

Kāwa'u, Hawaiian holly

Ilex anomala Hook. & Arn.

Holly family (Aquifoliaceae)

Native species (endemic)

Hawaii has one native tree species related to American holly of eastern continental United States, which is in the same genus. This handsome evergreen tree has elliptical leathery leaves, many small white flowers, and clusters of small rounded black fruits.

A medium-sized tree to 30 ft (9 m) high and 1 ft (0.3 m) in trunk diameter, often a small shrub, with irregular crown, hairless throughout. Bark light to dark gray, smooth. Inner bark with outer green layer, light yellow with brown streaks, bitter. Twigs stout, slightly angled, light green, with raised half-round leaf-scars. End buds more than $\frac{1}{8}$ inch (3 mm) long, composed of pointed scales which form a ring around twig to mark end of season's growth.

Leaves alternate but partly crowded, with light green leafstalks $\frac{1}{4}$ – $\frac{3}{4}$ inch (6–20 mm) long, flattened above. Blades elliptical, mostly $1\frac{1}{2}$ – $3\frac{1}{2}$ inches (4–9 cm) long and 1– $2\frac{1}{2}$ inches (2.5–6 cm) wide, thick, stiff, brittle, and leathery, rounded or blunt at both ends, turned under at edges (rarely with teeth, except on seedlings), above shiny dark green with network of fine veins slightly sunken, beneath dull light green with inconspicuous veins.

Flower clusters (cymose panicles) 1–3 inches (2.5–7.5 cm) long at leaf bases, the long stalk and branches flattened. Flowers many, short-stalked, from rounded greenish buds, male and female on different plants (dioecious), about $\frac{1}{8}$ inch (13 mm) broad. Calyx less than $\frac{1}{8}$ inch (3 mm) long, greenish, with 4–5 rounded lobes; corolla white, sometimes pink-tinged, composed of short tube and 6–12 widely spreading rounded lobes $\frac{1}{8}$ inch (3 mm) long; stamens as many as corolla lobes, attached in notches, white, in female flowers short and not functioning; and pistil with rounded yellow green 12–20-celled ovary, no styles, and as many crowded short stigmas as cells, in male flowers small and not functioning.

Fruits (drupes) common on twigs back of leaves, rounded but slightly flattened, about $\frac{1}{8}$ – $\frac{3}{8}$ inch (8–10 mm) in diameter, shiny black, smooth, with calyx and inch (3 mm) long, greenish, with 4–5 rounded lobes; corolla white, sometimes pink-tinged, composed of short tube and 6–12 widely spreading rounded lobes $\frac{1}{8}$ inch (3 mm) long; stamens as many as corolla lobes, attached in notches, white, in female flowers short and not functioning; and pistil with rounded yellow green 12–20-celled ovary, no styles, and as many crowded short stigmas as cells, in male flowers small and not functioning.

Fruits (drupes) common on twigs back of leaves, rounded but slightly flattened, about $\frac{1}{8}$ – $\frac{3}{8}$ inch (8–10 mm) in diameter, shiny black, smooth, with calyx and stigmas remaining, bitter. Nutlets 10–20, $\frac{1}{8}$ inch (3 mm) long.

Wood whitish, or grayish yellow with lighter colored sapwood, hard. It was prized by the Hawaiians for canoe trimmings and to make the anvil on which bark was beaten into bark cloth or tapa. It has also been used for saddle trees.

Common and widespread in open wet forests through the six larger islands, to 6500 ft (1981 m) altitude.

Special areas

Kokee, Haleakala, Volcanoes

Champion

Height 45 ft (13.7 m), c.b.h. 3.9 ft (1.2 m), spread 32 ft (9.8 m). Honaunau Forest Reserve, Kailua-Kona, Hawaii (1968).

Range

Hawaiian Islands only

Other common names

kā'awa'u, 'aiea

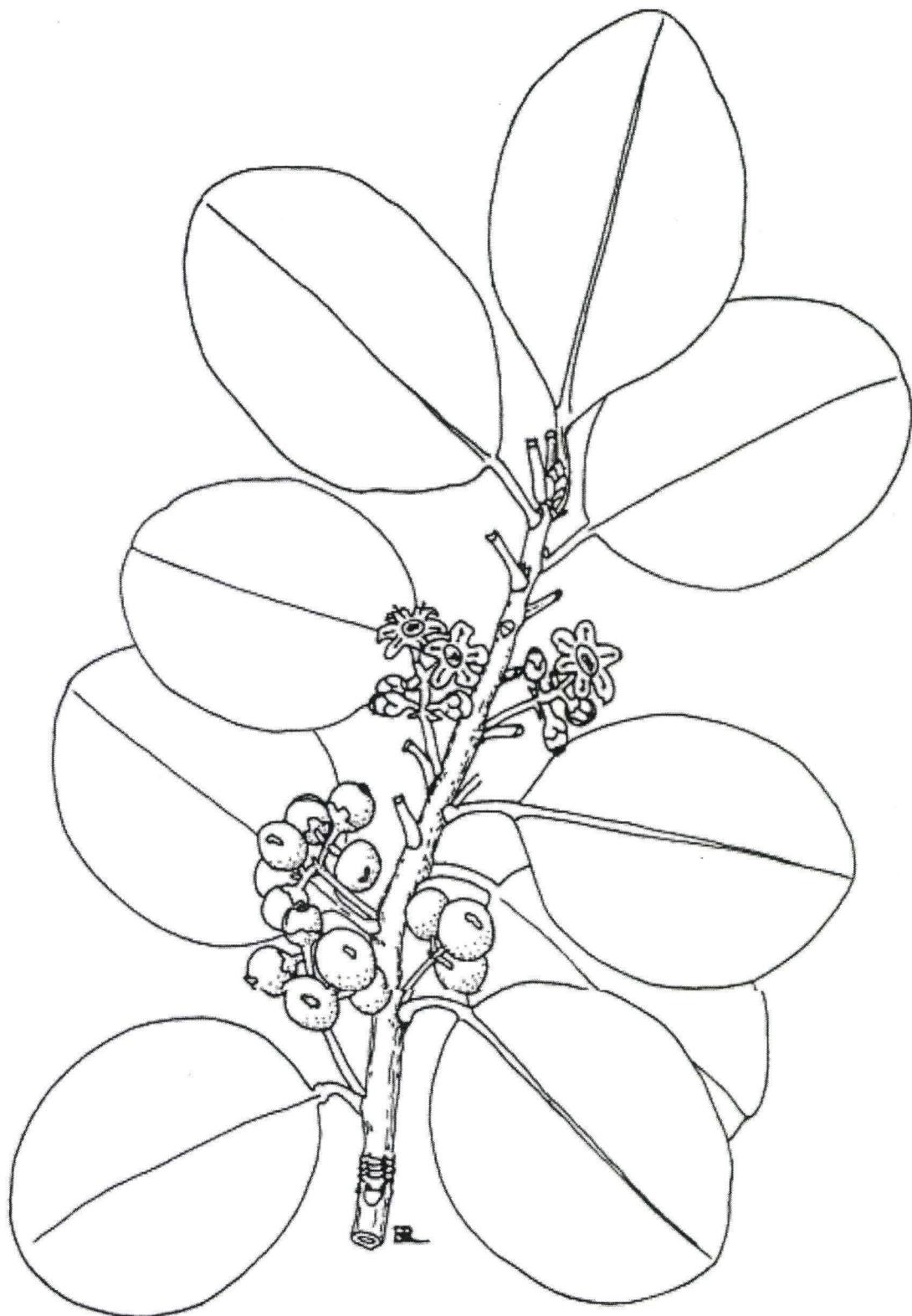
The name kāwa'u has been applied occasionally to *Styphelia*, *Mezoneuron*, and *Zanthoxylum* also.

Botanical synonyms

Ilex sandwicensis (Endl.) Loess., *I. hawaiensis* S. Y. Hu.

This very variable species and a few close relatives in Polynesia are classed as the most primitive for the genus of more than 350 species of wide, mostly tropical distribution. The Marquesan and Tahitian trees are scarcely distinguishable from those of Hawaii.

13Ag 5.2



Kāwa'u, Hawaiian holly
Ilex anomala Hook. & Arn.
Twig with flowers and fruits, 1 X.

Restoring Hawaii's Dryland Forests

(from Hawaii Forest Industry Association)

For ancient Hawaiians, the forests of these islands literally meant life itself. From them they gathered the resources and drew the spiritual inspiration that were the cornerstones of their culture.

The native dryland forests were a bounteous source of diverse plant materials used in vessels, implements, food gathering, fishing, shelter, medicines and rituals. Lowland dry forests were located on the dry leeward coasts between 300 to 1,500 feet in elevation, an area the ancient Hawaiians called the wao lama. Sadly, 90 percent of Hawaii's native dryland forests has been lost due to human activities such as land clearing, wildfires, and the introduction of alien species that have had disruptive and harmful effects.

E MALAMA I KA 'AINA': CHERISH THE LAND

Today, the remaining dry forests continue to be degraded and fragmented by land development, deforestation, fire, alien plant species, rodent predation and grazing by domestic and feral livestock. The native plants found here cling to a precarious existence: approximately half of Hawaii's endangered plant species are from dry and semidry environments. In the last decade, for both biological and cultural reasons, there has been a renewed and urgent sense of stewardship for these declining forests. A concerted effort to restore them is under way in the Ka'upulehu ahupua'a in North Kona on the Big Island of Hawai'i. Here, an organization called the North Kona Dry Forest Working Group (DFWG) is carrying out two demonstration restoration projects. The DFWG evolved from the concerns shared by many local citizens who approached the Hawai'i Forest Industry Association and the U.S. Fish and Wildlife Service about protecting and managing the remnant dryland forests in North Kona.

THE ENEMY: FOUNTAIN GRASS AND OTHER THREATS

Most of the landscape in the Ka'upulehu dryland forest is dominated by an introduced ornamental grass common to drier leeward areas of the Big Island. Fountain grass (*Pennisetum setaceum*) is an aggressive invader that suppresses the native vegetation and fuels dangerous wildfires that have proved devastating to native species. Eliminating the fountain grass and maintaining the site is extremely labor intensive. Existing grass must be cut back to its base and treated with herbicide. Once the fountain grass is dead, native species find it easier to become established and survive. Seedlings can be planted and irrigated to supplement natural regeneration. Although invasive plants still require manual and chemical control, the work becomes less intensive as the natural system recovers. Firebreaks, rodent control and fences to prevent grazing are also critical to protect the recovering forest.

A SUCCESS STORY

A six-acre parcel in the upper Ka'upulehu region, fenced as a forest reserve in the 1950's, has been restored by various strategies since 1995. Fountain grass and other invasive have been controlled, 200 native trees have been planted, irrigation has been installed, and fire and rodent control measures are in place. Because of these efforts, the site has become one of the highest quality native dry forests in Hawai'i. With this success, the focus of the DFWG shifted to a larger 70-acre parcel in the lower Ka'upulehu region. Here the DFWG has been working to duplicate the success of the smaller parcel on a larger scale, striving to develop techniques that can be practically applied across the larger landscape by private landowners and government agencies.

REACHING OUR OBJECTIVES

Like the ancient Hawaiians, the aim of the DFWG is to provide ongoing stewardship in both restoring and preserving these dry forest lands. The Group is testing methods of eliminating fountain grass, reducing fire hazards, maintaining fences and irrigation lines and identifying factors influencing natural regeneration. The results of this research are continually shared with the public and professionals through on-site field trips, seminars, workshops and publications. Combined with other dry forest restoration efforts statewide, this work will stimulate interest in and knowledge of the biological and cultural significance of native Hawaiian dry forests both in Hawai'i and elsewhere. Accomplishments to date are the result of hard work by volunteers and cooperating agencies' staff with funding support from government, private and scientific organizations. To effectively implement the results of the research, greater public participation and additional funding are needed. The DFWG also seeks to form partnerships with additional landowners interested in implementing their own projects. This will permit continued development of a cost-effective model of dry forest restoration.

ACADEMIC CONNECTIONS

Language Arts Connections in Agriculture Education

Name: _____ Date: _____

Teacher's Note: Hand this exercise out before discussing the careers of forestry.

Below are some of the career opportunities in forestry and their definitions. Attempt to match the career title with its definition by writing your answer on the line below the definition. After you are done, your teacher will go over the correct answers and you can see how many you got correct.

1. The scientific care of shrubs and trees in cities and towns.

2. Maintains land databases for forestry consulting firms and provides reports to forester and forestry firms.

3. Studies plants, trees, and wildlife. May establish forests, assess tree growth, investigates pest problems, and selectively harvest trees.

4. A person who harvest trees as logs. Involves using power and hand equipment to cut and trim logs, and skid them through the woods and loads them on a truck to be delivered to a mill.

5. Studies and manages tree stands to increase production. Controls forest establishment, composition, and growth.

6. Studies soils and creates soil maps for the forestry industry, farmers, and others.

7. Grows seedlings and conducts research manages tree nursery.

CAREERS:
Forester
Silviculturist
Computer Specialist
Soils Specialist
Arboriculturalist
Tree Nursery Worker
Logger

Answers

1. Arboraculturalist
2. Computer Specialist
3. Forester
4. Logger
5. Silviculturalist
6. Soils Specialist
7. Tree Nursery Worker

SUMMARY

Conclusion

Evaluation

See End of Unit

Agriculture Curriculum

Unit 18: Careers in Agriculture and Agribusiness

Lesson 1: Introduction to Career Opportunities in Agriculture

Student Objectives

1. Identify five full-time career opportunities in Hawaii agriculture.
2. Identify five part-time career opportunities in Hawaii agriculture.

References

Agriculture's New Professionals. Video. The FFA Video Collection. Alexandria: National FFA Organization.

Careers in Agriculture. Filmstrip. Urbana: College of Agriculture, University of Illinois.

Cooper, Elmer L. *Agriscience: Fundamentals and Applications*. Albany: Delmar.

Think About It. Alexandria: National FFA Organization.

Herren, Ray V. *Exploring Agriscience*. Albany, NY: Delmar Publishers, Inc.

Equipment, Supplies, Materials

TV/VCR

Careers in Agriculture powerpoint (Resource CD)

local *Yellow Pages* directories

Handout 18Ag 1.1 and 18AG 1.2

Transparency 18Ag 1.3

Teaching Procedure

Introduction and Mental Set

Agriculture is America's largest employer: nearly 23 million people work in agriculture and related fields. Only 2% of these people are actually involved in farming. Agriculture in Hawaii offers numerous job opportunities. The education required for these jobs varies. Some jobs require unskilled workers; others require skills gained in a high school education or on-the-job training. Still other jobs require technical or professional skills and college education.

1. Distribute copies of local *Yellow Pages* to the class. Have students list all the jobs related to agriculture that they can find.

2. Using the information found in #1, have students begin making phone calls, asking these people to participate in an Agriculture Career Day. Be sure to have a date already in mind.
3. Have students write down an agricultural career on a sheet of paper, then play agricultural *Charades* by having them act out the agricultural career or job they chose.

Discussion

1. **Question:** *What role does agriculture play in Hawaii's employment?*
Answer: One in every five jobs in Hawaii is agriculturally related.
2. **Question:** *What are some agricultural careers available in Hawaii?*
Make a list on transparency 18Ag 1.1 as the students name occupations.
Answer: Following are some of the many career areas in Hawaii. Most career areas offer part-time jobs for students.

- Landscaper
- Forester
- Wildlife manager
- Herd manager
- Greenhouse operator
- Soil conservationist
- Farmer or farm helper
- Aquaculturist
- Game warden
- Extension agent
- Veterinarian
- Agricultural teacher
- Veterinary assistant
- Parts clerk
- Park Ranger

Suggested Activity: Ask students to name people they know who work in Agriculture. Discuss the basic science skills required to work in each area mentioned. Invite resource people from the community to speak to the class.

Additional Activities

1. Draw a food product (i.e. bread or milk) in the middle of a sheet of paper and web the careers involved in getting that food product to the consumers kitchen. Focus on all the research, development, testing, manufacturing and marketing that is involved in making sure that the food product is of good quality and is safe for consumers.

2. Have students select a career from the list. It is best if there is no overlap. Have them research this career (using the Internet) and fill out the "Career Investigation" worksheet. (18Ag 1.2)
3. Ask the students to use the research they found to write an informative paper.
4. Have students give a short oral presentation on their findings.

ACADEMIC CONNECTIONS

Language Arts

Connections in Agriculture Education

Name: _____ Date: _____

Date: _____

Today you learned about numerous career opportunities in agriculture. If you could have any of the careers discussed, which one would you choose? Why? What duties would you have in the career? What about the job do you think you would enjoy? What parts of the job would you dislike? Answer these questions in paragraph form in the space below.

Summary

Conclusion

Agriculture offers a number of satisfying careers, and because of the wide diversity of skills needed, everyone can find a place in agriculture. Nationally, more than 20% of America's work force is employed in occupations related to agriculture.

Evaluation

Written Quiz

Agriculture is America's Largest Employer!

Agricultural Careers in Hawaii:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Agriculture Career Investigation

Name: _____ Date: _____

Start your Internet search at the Teen Scene,
www.agclassroom.org/teen/index.htm.

1. What is the name of this occupation?

2. What duties or responsibilities go along with this job?

3. What skills are needed for this job?

4. What type of personality is needed for this job?

5. What physical requirement or limitations are associated with this job?

6. What educational background is required?

7. What courses, especially in science, should be taken in high school and in college?

8. What is the best type of school to attend to attain the necessary skills?

9. What other high school courses should be taken to prepare for this position?

10. What are some positive aspects of this job?

11. What are some negative aspects of this job?

12. How does this profession help to better society?

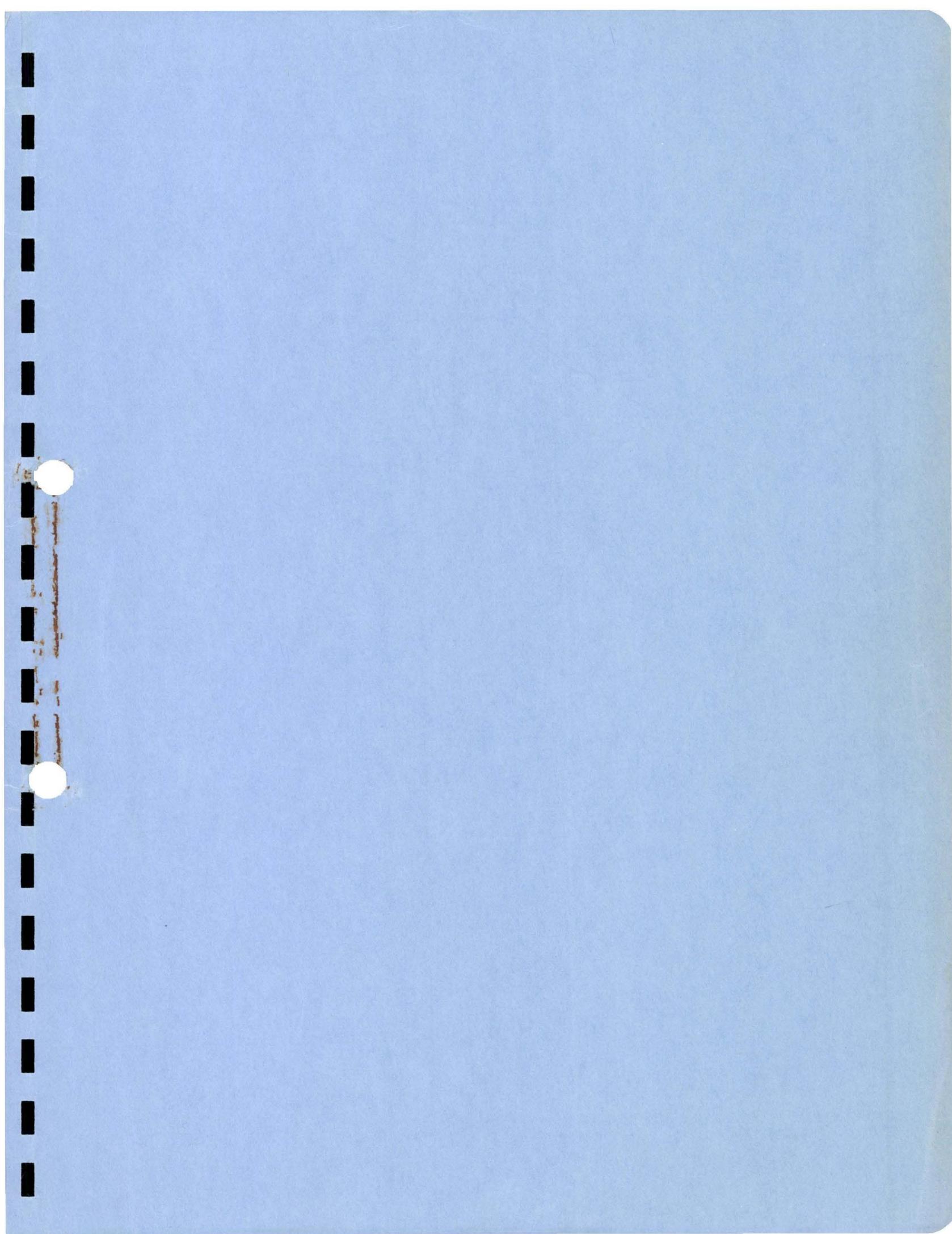
13. What is the demand for people in this position like today?

14. What is the outlook for this job in the future?

Career Opportunities in Agriculture

Examples:

Ag Accountant	Equipment Dealer	Meat Cutter
Ag Chemical Dealer	Farm Appraiser	Meat Scientist
Ag Electrician	Farm Broadcaster	Meteorological Analyst
Ag Investment Manager	Fiber Technologist	Microbiologist
Ag Journalist	Field Inspector	Nematologist
Ag Lawyer	Fire Warden	Orchard Supervisor
Ag Loan Officer	Fish Farmer	Organic Chemist
Ag Photographer	Fish Hatchery Manager	Oceanographer
Ag Public Relations	Floral Designer	Parasitologist
Agribusiness Manager	Florist	Park Ranger
Agriculture Teacher	Food Chemist	Pest Control Technician
Agriculturist	Food Process	Pharmacologist
Agriscience Researcher	Supervisor	Poultry Scientist
Agronomist	Food Scientist	Quality Control
Ag Scientist	Forester	Supervisor
Aquascience	Forest Ranger	Range Manager
Animal Behaviorist	Game Farm Supervisor	Safety Engineer
Animal Cytologist	Game Warden	Salesperson
Animal Geneticist	Geneticist	Scientific Illustrator
Animal Health Products Distributor	Golf Course	Scientific Writer
Animal Physiologist	Superintendent	Seed Analyst
Animal Nutritionist	Grain Broker/Buyer	Silviculturist
Apiculturist	Grain Elevator Buyer	Soil Conservationist
Arboriculturist	Greenhouse	Soil Engineer
Bacteriologist	Management	Soil Scientist
Beekeeper	Ground Water Geologist	Tobacco Buyer
Biochemist	Home Economist	Turf Grass Management
Bioengineer	Horticulturist	USDA Inspector
Botanist	Hydraulic Engineer	Veterinarian
Christmas Tree Producer	Hydrologist	Wildlife Biologist
Computer Analyst	Ichthyologist	Winery Supervisor
County Extension Agent	Insect & Disease Control	Zoologist
Crop Consultant	International Specialist	
Crop Duster	Irrigation Engineer	
Crop Scientist	Lab Technician	
Dairy Nutritionist	Landscape Architect	
Ecologist	Land Surveyor	
Economist	Livestock Consultant	
Embryologist	Livestock Rancher	
Entomologist	Machine Engineer	
Environmentalist	Mammalogist	
	Marine Biologist	



SPECIAL PERMIT
APPLICATION

for the

KAHILI
ADVENTIST SCHOOL
KOLOA, KAUAI, HAWAII

LAND USE COMMISSION
STATE OF HAWAII

APR 21 9 45 AM '87

Document Prepared by:
Kahili Adventist School

As adopted from a document prepared by:
HOE/KAUAHIKAUA & CHUN
Joint Venture Architects
Kawaihao Plaza Hale Mauka
576 South King Street, Suite 108
Honolulu, Hawaii 96813

March 2, 1987

State of Hawaii Land Use Commission
Lihue, Kauai, Hawaii 96766

Attention: Executive Director, Land Use Commission

Subject: Application for a Special Permit for expanded school and church use at Kahili Mountain Park, Island of Kauai, Tax Map Key 2-7-01:1 School Use of the Kahili Adventist School.

Application is hereby submitted for a special permit as required by the County of Kauai Planning Commission since the uses of the property will involve acreage greater than the 15 acre limit.

Included in this submittal is the following:

APPLICATION DATA:

- Application for a Special Permit,

EXHIBITS:

- 'A' - Island of Kauai
- 'B' - Plot Plan
- 'C' - Special Permit, # , Use and Class IV. Zoning Permit, original application, dated May 1982 Reference No: S-84-5
- 'D' - Kahili Adventist School Enrollment Table
- 'E' - Existing Site Zoning
- 'F' - Proposed Site Zoning
- 'G' - Proposed Development

APPLICATION OUTLINE

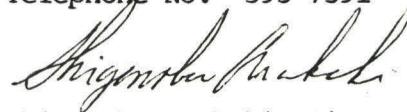
- SECTION i Introduction, Cover Letter
- SECTION I Application Statement, General Statement of Purpose, Time Frame. (See SECTION IV)
- SECTION II Brief History and Background of Kahili Adventist School
- SECTION III Site Data
- SECTION IV Site Use Projections
- SECTION V Conditions Justify Use Permit
 - a) Special Permits (5 point test)
 - b) Miscellaneous Requirements
- SECTION VI Similar School Projects, World Wide Scope
(General Conference of Seventh-day Adventists)
- SECTION VII Closing Statements
- SECTION VIII Letters of Support
- Appendix:
 - EXHIBIT: "A"
Island of Kauai
 - EXHIBIT: "B"
Plot Plan
 - EXHIBIT: "C"
Special Permit, Use and Class IV. Zoning
Permit application, dated May 1982
 - EXHIBIT: "D"
Kauai Adventist School Enrollment Table
1975 - 1986
 - EXHIBIT: "E"
Existing Site Zoning
 - EXHIBIT: "F"
SITE ZONING
 - EXHIBIT: "G"
Proposed Development

Please review this application and feel free to contact us if there are any more questions that you might have. If this could be scheduled at your earliest convenience, it would be appreciated. Thank you for your time and consideration.

Sincerely,



R. K. Among, Director of Development
Hawaii Conference of SDA
2728 Pali Highway
Honolulu, Hawaii 96817
Telephone No: 595-7591



Shigenobu Arakaki, Director
Kahili Adventist School
P. O. Box 480
Lawai, Hawaii 96765
Telephone No: 742-1531

SECTION I APPLICATION STATEMENT

This application to the State Land Use Commission is for school and church related uses of the Kahili Mountain Park site, which necessitates a SPECIAL PERMIT since the property exceeds 15 acres in size.

GENERAL STATEMENT OF PURPOSE:

The intended goal of the applicant is to relocate its entire school facility (Kauai Adventist School, grades 1 thru 10), from its present Omao site to the subject property. It is the plan and goal of the school to expand its educational facilities (to include Kindergarten through grade 12). A high priority of the school is to develop an Agricultural and Work-Study Program for its students. The development of a spiritual retreat center, health conditioning center, and health museum will contribute to work study opportunities.

TIME FRAME:

It is our purpose to proceed with the developing of the Kahili property with the school expanding as quickly as possible to a higher level. Presently existing on site are the relocated grades of 8-10, which are being bussed to the site. Classes are being held in two portable buildings, and a school building to house the elementary grades is presently under construction.

EXISTING COUNTY PERMITS AND APPROVALS:

On December 14, 1983 the Kauai Planning Commission approved Special Permit SP-83-1, Use Permit U-2#83 and Class IV Zoning Permit Z-IV-83-3 to relocate the Kauai Adventist School to a 14 acre portion of the property. At that time, use of the entire property for school and church related use was not intended. However, a shift in the thinking has now reflected the appropriateness of master planning and utilizing the entire property for school and church related use. This is the purpose of this Special Permit request. (see attachments) Also, Planning Commission condition of approval #7 requires Land Use Commission approval should the school use exceed 15 acres.

On January 28, 1987, the Planning Commission approved a one year time extension to November 27, 1987 in which to secure a Special Permit from the State Land Use Commission.

PREVIOUS LAND USE COMMISSION APPROVAL:

A Special Permit to allow the establishment of the Kahili Mountain Park recreational facilities containing the existing uses on the property was approved by the Land Use Commission on December 15, 1967.

KAUAI PLANNING DEPARTMENT
LIHUE, KAUAI

STAFF REPORT

PROJECT: USE PERMIT U-2-83
SPECIAL PERMIT SP-83-1
CLASS IV ZONING PERMIT Z-IV-83-3

APPLICANT: Hawaiian Association of Seventh-Day
Adventists

FINDINGS

LOCATION: KAHILI MOUNTAIN PARK, Kauai. In the vicinity of Knudsen Gap, mauka of Kaumualii Highway, and is accessed by a dirt road approx. 1,600 ft. west of the junction of Maluhia Road and Kaumualii Highway.

TMK: 2-7-01: por. 1

AREA: _____

LAND USE CLASSIFICATION Ag

GENERAL PLAN DESIGNATION Ag

EXISTING USE recreational park use

ZONING open

ACTIONS REQUIRED:

REASONS:

USE PERMIT is necessary since school facilities are not generally permitted within the Open District "O"... SPECIAL PERMIT is required because a school facility within lands designated "ag" by the State LUC is not an outright permitted use... CLASS IV ZONING PERMIT is a procedural requirement since a Use Permit is involved.

PROJECT DESCRIPTION AND USE: Applicant proposes to relocate its present school facility (Kauai Adventist School) from its present Omao site to the proposed Kahili Mountain Park site; expansion from K-12, from existing 1-10, and an Ag-work study program is also proposed.

LEGAL REQUIREMENTS (Parking, Lot Coverage, etc.)

Should the project be approved, applicable CZO requirements, as well as other agency rules and regulations, will have to be adhered to.

APPLICANT'S REASONS/JUSTIFICATION: The Kauai Adventist School original enrollment started over 30 years ago, in the Kapaa vicinity. In 1975 the campus was relocated to the Lawai site and has operated as a secondary school facility from that year to the present date, maintaining an open door admissions policy to the public on a selective basis.

B-1

The original purpose of starting a private church school operation was to provide the members of the Kauai Adventist Churches, with congregations located in Kapaa and Lawai, a chance to send their children to a private church school where the philosophies of the Seventh-day Adventist Church was the basis for education. The initial student enrollment was modest in size, but increased during the next few years. The school year 81/82 showed that the enrollment had multiplied by a factor of 2.6+ times the enrollment of 1975.

It was during the first part of the 81/82 school year that the School Board decided to evaluate its existing facilities and project its future needs. A committee was formed to undertake this study and to come up with some recommendations. The Committee undertook the study of the school's present and projected needs, and came up with the following recommendations:

RELOCATION RECOMMENDATIONS

A. Relocation of the Kauai Adventist School campus due to the following influencing factors:

1. Current Need to Expand Classroom Facilities; this would require new buildings on a limited buildable site. The present location is situated on a hillside property, with steep slopes.
2. Parking Lot Expansion:
 - a. Auto parking lot area is limited for future expansion requirements.
 - b. School bus parking area is not adequate and is limited when incorporating all of the site needs for future expansion requirements.
3. Development of Work-Study Program Potential; A total lack of useable space for the development of a much desired Work-Study Program. This program, when included in the school educational program, would be a very important basis of the curriculum. This program would fill a need that is presently lacking in other educational institutions now operating on Kauai.

B. Based on the above listed reasons, the Committee then established criteria for finding a new campus site. The criteria were as follows:

1. A central location for all constituents
2. Sufficient sized property for expansion
3. Suitable for agriculture work-study program, etc.

4. Site purchase price to be economically feasible.

C. Possible sites for the relocation were listed and discussed. Some of the areas looked at are as follows:

1. Kilauea area - Not central location.
2. Kapaa area - Available lots inadequate in size.
3. West-Kalaheo area - Utilities, water, power, etc., high cost of development improvements.

SITE CHOICE

The site that seemed to be the most suitable was the property called "Kahili Mountain Park." The committee's interest in the property was increased when the owners reduced their selling price by one-half the asking amount. They also stated that out of the two interested parties looking at purchasing the property, they preferred the potential of a private school facility over the other party's proposed use. This development of events was taken as a sign that the project site of Kahili Mountain Park was the chosen location by Divine direction. Thus negotiations to purchase the property were entered into with the owners, Knudsen Trust, et al, for the future location of "Kahili Mountain Adventist School."

FINDINGS (cont'd):

1. This permit request was originally submitted to the Planning Department for processing on July 28, 1982. The applicant requested that the scheduled public hearing be postponed in order to address the concerns stated by the various government agencies. The applicant is now ready to proceed, based on the detailed study document submitted by Hoe/Kauahikaua and Chun, Joint Venture Architects.

The following are excerpts from the study document:

- a. The projected use of the site and timetable (tentative):
 - 1) Relocation of the present school facility (grades 1 thru 10, occupancy for 1984/1985 school year).
 - 2) Expansion of the school program (K thru 12, Phase II; 2 to 5 years from start to Phase I).
 - 3) Agriculture Work Study Program (immediate start-up, and future phased implementation).
 - 4) Utilization of current campground facilities to continue operation, open to the public, on a similar operation basis.
 - 5) Future development, relocation, and expansion of campground site facilities for private religious and educational

retreats (public use to be phased out, after Phase II implementation).

- 6) Horse stables and boarding to be continued, similar to the existing operation. Future operation of the stables may involve relocation of this use to another part of the site.
- b. Some of the agricultural uses being considered are as follows:
 - 1) Food Products/Agriculture: watercress, banana patch crops, avocado pear orchards, lychee orchards (upgrading of existing), specialty pineapples, papayas, nut orchards, taro patches, vegetable truck farming, etc.
 - 2) Food Products/Farm: eggs, bees, honey, etc.
 - 3) Non-Food/Agriculture: landscape plants, ornamentals, flowers, nursery items, indoor plants, etc.
2. A Special Permit to allow the establishment of the Kahili Mountain Park recreational facilities containing the existing uses on the property was approved by the Land Use Commission on December 15, 1967.

On July 23, 1975, the Planning Commission approved a Use, Class IV and Special Permits to construct 20 additional two-bedroom, one bath cabins with kitchenettes, a recreation building and an employee gate cabin. To date, none of the cabin structures have been constructed.

3. Existing Conditions:

- a. Soils - Map #65 and 75 of the "Detailed Land Classification - Island of Kauai" by the Land Study Bureau classifies the soils on the site as C, D and E on a scale of A (best) to E (worst).

Map #22 of the "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii", by the USDA Soil Conservation Service reflects Lawai Silty Clay as the predominant soil type (LcB, LcC and LcD). Slopes range from 0-25%. Rain runoff is slow to medium.

- b. Access - From the Kaumualii Highway entrance for approximately 0.8 mile, access is over a crushed cinder and dirt cane haul roadway approximately 30 feet wide. From that point to the Kahili Mountain Park entrance is a dirt roadway with a variable width of 11 to 15 feet wide. Two-way traffic is not possible, and the road is in a deteriorating condition. This driveway traverses a stream that can prevent access depending on the amount of rainfall. Interior roadways are also dirt roads.
- c. Water Supply - Kahili Mountain Park has its own water supply and system, including hypochlorinator, that meets the Department of Health's standards.

- d. Electricity - Power is supplied by Kauai Electric. Diesel generators provide back-up power.
- e. Fire protection - Since a County standard water system does not service the site, garden hoses and fire extinguishers service each individual structure.

4. Relative to the increased use of the cane haul road for access, comments were submitted in October, 1982, by McBryde Sugar Company and Valdemar Knudsen (see attachments 1 and 2).

Letters of support for the project (on file) were submitted in 1982 by Julia Oliver, Donald Oliver and Glenda J. Vander Kam.

5. In 1982, the Land Use Commission was queried by the City and County of Honolulu's Department of Land Utilization as to whether an educational facility in the State Land Use Commission's "AG" District should be considered under a Special Permit, or more appropriately, under a boundary change in light of the Supreme Court's decision regarding the Special Permit for a Theme Park at Kahe Point, Oahu (see attachment 3).

AGENCY COMMENTS:

STATE HEALTH DEPARTMENT: We have no objection to the application at this time. However, our department's concerns are as follows:

- 1) The proposed development shall meet the requirements of Chapter 2, Housing, and Chapter 38, Private Wastewater Treatment Works and Individual Wastewater Systems, Public Health Regulations.
- 2) The proposed development shall meet the requirements for minimum sanitary facilities according to Chapter 11 of Title 11, Administrative Rules.
- 3) Grubbed material generated by land clearing shall be disposed in a manner and at the site approved by the Department of Health.
- 4) Effective dust and soil erosion control measures shall be implemented during all stages of development by the developer.

Due to the general nature of the application submitted, we reserve the right to implement further environmental restrictions when more detailed plans are submitted.

FIRE DEPARTMENT: The Fire Department has no objections to the proposed permit application provided:

- 1) Access roadways have all-weather driving surface of not less than 20 feet of unobstructed width, with adequate roadway turning radius capable of supporting the imposed loads of the fire apparatus and having a minimum of 13 feet 6 inches of vertical clearance.

- 2) County approved water lines with fire hydrants having the required fire flow be located within 250 feet to all sections of the proposed buildings to be protected.
- 3) All buildings shall have a minimum 2-A rated ABC-type of fire extinguisher mounted 5 feet from the floor near the exit.
- 4) Comply with all other requirements of the Kauai County Fire Code.

STATE DEPARTMENT OF EDUCATION: The Department of Education has no objections or comments to the change. Thank you for allowing us to review and offer comments.

PUBLIC WORKS DEPARTMENT: Access to the school site is through a roadway that does not meet County standards. Our concern would be access without an all-weather surfacing, especially with the increase traffic demand associated with a school.

WATER DEPARTMENT: We do not have a domestic water system in this area and, therefore, have no comments to this Zoning and Use Permit Application.

By 

Michael Laureta
Planner

12/8/83

McBryde

SUGAR COMPANY, LIMITED

OCT 14 1 82

COUNTY OF KAUAI
PLANNING DEPT.
LIHUE, KAUAI

October 13, 1982

Planning Department
County of Kauai
4280 Rice Street
Lihue, Hawaii 96766

Yoshiochi
Fukumoto
Yamashiro
Moura

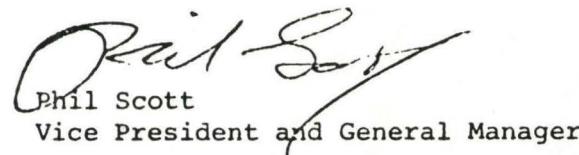
Special Permit SP-83-1, Use Permit U-2-83
Class IV Zoning Permit Z-IV-83-3
Hawaiian Association of Seventh-Day Adventist, Applicant
TMK 2-7-01: Por. 1 (Approx. 215 acres)

We acknowledge receipt of your letter of September 15, 1982 and thank you for the opportunity to comment on this matter. The following are our comments concerning the application for permits from the Hawaiian Association of Seventh Day Adventists on the Kahili Mountain Park site.

1. The use of our haul cane road (Field 604 & 600) by the general public may develop into a problem. Although the road is now used by Kahili Mountain Park, traffic will increase with the location of the school in the area. This increased traffic will increase problems along the roadway. The road at present is unimproved and when harvest operations are in progress in fields adjacent to the road, conditions are poor with mud, ruts with heavy equipment present. McBryde must keep the road open for park guests, but the amount of increased work required due to increased vehicular traffic will be too expensive for McBryde to handle.
2. The general condition of the unimproved road may cause problems for unexperienced drivers commuting to the school. Who would be liable for potential accidents which would occur on the road?
3. The area adjacent to the proposed site is an agricultural area in sugarcane cultivation. The applicant should be aware that agricultural activities involve dust, machinery noise, aerial equipment applying fertilizers and herbicides and operations which can occur twenty-four hours a day for seven days a week.

Thank you for the opportunity to comment on the application and please feel free to call us if you have any further questions.

Very truly yours,

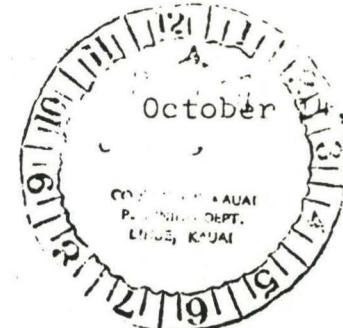

Phil Scott
Vice President and General Manager

LN:JWH:jm

cc: A&B Properties--Hon.
Larry Nishikawa
Valdemar Knudsen

ATTACHMENT 1

KAHILI MOUNTAIN PARK INC.
P.O.Box 757, Koloa, Hawaii 96756



Planning Department
County of Kauai
4280 Rice Street
Lihue, Hawaii 96766

Gentlemen,

I wish to comment on the letter submitted by Manager Phil Scott re changing the use of Kahili Mountain Park from a camping resort to a school.

1. Kahili Mountain Park holds a Right-of-Way across the fields now in sugarcane as part of their lease from the Knudsen Trusts upon which Kahili Mountain Park was created. When Grove Farm built the canehaul road in its present location it was agreed that mutual use of the road would cause far fewer problems for BOTH parties if joint use of the roadway was made, since part of the original R/W used by Kahili Mountain Park made use of an old fill that Grove Farm wished to follow with their new road. We believe that it would be far more expensive for McBryde to move the canehaul road from its present location in the event that traffic becomes a problem, than to state the fear that maintenance would become too expensive for the plantation.

2. For the many years that KMPI has been in operation McBryde has harvested the sugar fields adjacent to Kahili Mountain Park during the summer months. During the summer was the time of greatest occupancy experienced by KMPI. Since schools are closed during the summer vacation, we believe that FAR LESS problems will be caused by the anticipated school traffic flow than are experienced now.

3. The lease terms that Kahili Mountain Park holds protect the plantation in its agricultural activities. The applicant fully understands these conditions. The proposed location of the school's buildings is much further removed from the sugar fields than the buildings of the Waimea Canyon School, and Kauai High School, to name two that come to mind. The Koloa School seems also quite close to sugar areas.

Yours truly

VALDEMAR KNUDSEN, PRESIDENT

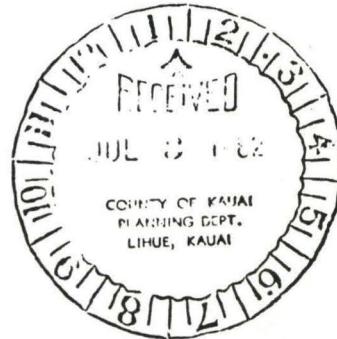
cc Mr Phil Scott, Manager
McBryde Sugar Company
Eleele, Kauai

ATTACHMENT 2

State of Hawaii
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813

planners

August 2, 1982



Mr. Michael M. McElroy
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

I'm very sorry for the very tardy response to your request for guidance regarding the Brown Schools of Hawaii and Coral Kingdom. Specifically, you requested whether these projects may be considered under a Special Use Permit or whether they would be more appropriate as boundary changes in light of the Supreme Court's decision regarding the Special Permit for a Theme Park at Kahe Point, Oahu. Part of the delay was due to the approach taken to respond to your inquiry. In view of the Supreme Court ruling on the Special Permit for a Theme Park at Kahe Point, we recognized that a major change to past practices regarding Special Permits were forthcoming and a major concern of this change centers around the question you raised. Therefore, rather than look for a case by case response to your question regarding the two projects, we sought for a solution that would provide general guidance as to what projects should come under a Special Permit and those under a boundary change.

Under the present provisions of the statutes and rules and regulations, a clear articulation of the process that different projects must follow is not possible. We believe that the statutes and/or rules and regulations must be amended to accomplish this task. We will be working to examine alternatives and possible changes that could be proposed to the Legislature. We believe this area of articulation and definition is the crux of the problem and solution to the question you raised.

In the meantime, we need to operate under the present provisions of the law and regulations. In discussing this matter with the deputy attorney general assigned to the Land Use Commission, I'm advised that this agency is not

ATTACHMENT 3

Mr. Michael M. McCoy

Page 2

August 2, 1982

provided with the authority to make judgments on interpretations of the law that are final and binding upon all counties and Special Permit applicants. The Land Use Commission's interpretation of what uses should be established under a Special Permit and what uses should be established under a boundary change does not have any legal bearing on the counties' interpretation on these matters. If, at the County level, a difference of opinion on what procedure should be followed between the County and applicant arises, the recourse would be an appeal at the Circuit Court. The same procedure would be followed at the Land Use Commission level. The Land Use Commission would apply its interpretation of what uses should come under a Special Permit or boundary change once the matter is brought before the Commission. Again, any difference in interpretation by the County or applicant could be appealed to the Circuit Court.

In summary, the procedure we're suggesting at this time (until better articulation of what should be processed under a Special Permit is better defined) is that the Special Permits should be processed and if certain proposals are deemed inappropriate for processing under the Special Permit route by the County planning departments, this position and reasons should be expressed to the Planning Commission for its interpretation and decision. Any party not satisfied with the decision of the Planning Commission can appeal to the Circuit Court. We could provide you with information on past land use determinations and what has been processed under a Special Permit in the past for some guidance. However, the basis for these past decisions have been eroded by the Supreme Court ruling on the Kahe Theme Park Special Permit and will not be of great help in resolving these questions.

I am aware that our response to the question you raised in your earlier letter is far from solving your problems, however, we are working on a better solution and may require your input later on. In the meantime, if I may be of further assistance to you on this matter, please contact me.

Sincerely,



GORDON Y. FURUTANI
Executive Officer

GYF:yk

cc: Mr. Willard Chow
Mr. Sidney Fuke
Mr. Tosh Ishikawa
Mr. Brian Nishimoto

RE: Special Permit SP-83-1
Use Permit U-2-83
Class IV Zoning Permit Z-IV-83-3

APPLICANT: Hawaiian Association of Seventh-Day Adventist

EVALUATION:

PROPOSED USE - In reviewing the rules and regulations of the State Land Use Commission relative to the list of permitted uses in the Agriculture District, it was determined that educational facilities are not a permitted use in the Agriculture District. However, mitigating aspects of the proposed use include:

1. The existing resort/recreational aspect of Kahili Mountain Park relative to the amount of passenger car traffic already utilizing the cane haul road for access;
2. The ease of converting the existing structures to school-related uses;
3. The existing agriculture uses of the property, and its overall size in order to accommodate the proposed ag work-study emphasis; and
4. The Agriculture Work-Study Program intended to be developed as part of the school's curriculum.

Kahili Mountain Park seems to be compatible with the surrounding agricultural uses, and appears to have adequate support facilities, utilities and structures. Since the proposed development plan and timetable reflects that the existing structures will be maintained and utilized, it is felt the school use will not substantially alter or change the essential character of the land. If such were not the case, we would strongly prefer to see the school use relocated to the Urban District.

Similarly, according to the Comprehensive Zoning Ordinance, the proposed use within the Open District is not an outright permitted use; however, it could be accommodated through a Use Permit. In reviewing the standards of the Use Permit, we have determined the proposed school use and accompanying agriculture work-study program can be compatible with the surrounding agricultural use, provided all the recommendations in this report are adhered to. The use then would not be detrimental to health, safety, peace, morals, comfort and general welfare of persons residing or working in the area. Further, it will not cause any substantial harmful environmental consequences on the land of the applicant or on any other lands or waters, provided all government agencies' rules and regulations are adhered to.

However, it is our opinion that the proposed agriculture work-study program is the major element that can be considered in evaluating an educational facility at this location, since such use does relate to the Agriculture District. Should this part of the curriculum, as proposed, be discontinued for any reason, it is recommended that the Planning Commission reconsider the applicable permits, should this project be approved.

ACCESS - The present access is via a dirt and crushed cinder roadway which is unimproved and primarily for cane haul usage. Since the school use will intensify the daily traffic utilizing the cane haul road, user safety is our primary consideration for the establishment of an educational facility in such a remote area currently not planned for such use.

At a minimum, roadway improvements from the highway to the site should be provided in order to enhance both the facility and the safety of those who use it. For an educational facility to be serviced by substandard dirt roadways would not further the public's health, safety, and welfare in that it would not have all-weather service capabilities.

On-site road right-of-way improvements (i.e., widening, all-weather surfacing, and drainage) will also be necessary, especially in the driveway area from the cane haul road to the site, as two-way traffic is not possible. Also, this area would be susceptible to flooding due to the existing stream. Since the existing fire protection measures could be considered substandard, these roadway improvements would also be beneficial for the County's fire fighting apparatus should the need ever arise.

Should roadway improvements not be provided in conjunction with the school usage, we are of the opinion that such use would not be appropriate in this location since safe access at all times cannot be assured. To date, we are unaware of an educational facility in the State, public or private, that is presently accessed by substandard dirt roadways.

ULTIMATE DEVELOPMENT OF THE AREA - Inasmuch as the proposal before us is only to establish a school use in the Open District, it is felt that additional Planning Department and/or Planning Commission review is necessary at such time that:

1. Final building design analysis for the proposed school building is finalized;
2. The faculty housing portion of the master plan is undertaken;
3. The existing cabin/cabinette use is converted to any other use, such as classrooms, teacher or student housing; and/or
4. Any other use is proposed, such as student boarding, church use, etc.

Important elements that must be emphasized that will enhance rather than detract from the site include the use of non-reflective, earth-tone colors, single-story structures, use of exterior wood paneling and/or trim, and the establishment of an architectural theme conducive to the area. These elements are important in maintaining compatibility to the Agriculture District in which it is located; any deviation could bring about a distinct appearance more suitable to the Urban District. Compatibility, both in terms of architecture and overall development, must be emphasized.

FUTURE LAND USE - The existing General Plan designation for the site is Agriculture, as is the State Land Use Commission's land use designation.

Should this request be approved and subsequent improvements to the site be provided, these approvals and improvements shall not implicitly or explicitly indicate that said use of the property is then compatible to a State Land Use "Urban" land use designation. To the contrary, given the site's remote location, surrounding agricultural uses, General Plan and State Land Use Commission designations, the Agriculture District is the appropriate land use designation.

LAND USE COMMISSION'S FIVE-POINT TEST FOR SPECIAL PERMITS - In applying the test for Special Permits, as specified in the Land Use Commission's Rules and Regulations, the following are noted:

1. The proposed use is not contrary to the objectives sought to be accomplished by the Land Use Law and Regulations on the basis that the proposal will permit continuance and reasonable use of the property. Although a school use is better suited to the Urban District, the subject site has existing structures and utilities that will be accommodated with the proposal, should it be approved. Furthermore, the applicant intends to develop a work-study program particularly in the field of agriculture that will make this site ideal for that purpose.
2. The proposed initial development should not adversely affect surrounding agricultural use. Inasmuch as the plans submitted are only conceptual proposals at this time, future development of additional support facilities should be architecturally compatible to the existing environment and structures. The surrounding properties will still be maintained for sugar cane cultivation.
3. It is anticipated that the proposed use would not burden public facilities. Utilities such as water and electricity already exist. Relative to access, in order to accommodate the increased traffic volume and to enhance user safety, roadway improvements should be required of the applicant as conditions of approval, if approved. Access directly off of Kaumualii Highway is via a cane haul dirt road which has sufficient width to enhance safety and sight distance. A driveway from the cane haul road to the site has a variable right-of-way width of 11-15 feet, cannot accommodate two-way traffic, and could be subject to difficult access in time of bad weather. Improvement costs for the above roadways shall be borne by the applicant.
4. No unusual conditions have arisen since the district boundaries and regulations were established. However, a growing trend both locally and statewide has been towards stressing the importance of agriculture and its diversification for the local economies. The proposed use in conjunction with an agriculture work-study program can ensure that an educational base to further encourage agriculture exists.
5. The proposed site has uses occurring that are permissible within the "A" Agricultural District, such as recreational day camp,

raising of livestock, and riding stable and barn with accessory structures. The proposed development could be considered to be compatible to the district on the basis that many of those uses mentioned above will be maintained, although the emphasis will now be placed on education rather than only recreation.

Since the proposed school use does not exceed 15 acres, the Special Permit need not be forwarded to the Land Use Commission for subsequent approval at this time.

CONCLUSION:

Based on the foregoing findings and evaluation, it is concluded that the proposed use of the property as an educational institution stressing an agriculture work-study program:

1. Would not adversely affect the agricultural use of the surrounding property, would not unreasonably burden public facilities, and will not substantially alter or change the essential character of the land should design parameters as mentioned in the staff report be strictly adhered to;
2. Can be safely accommodated should access improvements to allow for two-way traffic and all-weather surfacing (a/c pavement) from the highway to the site be provided; and
3. Is consistent with the criteria established for a Special Permit by the State Land Use Law.

It is further concluded that the Planning Commission should reserve the right to revoke or modify the permits should: 1) the agriculture work-study aspect of the curriculum be discontinued for any reason; or 2) problems arise that would affect the health, safety and welfare of the public.

RECOMMENDATION:

Based on the foregoing findings, evaluation and conclusion, it is hereby recommended that Use Permit U-2-83, Special Permit SP-83-1 and Class IV Zoning Permit Z-IV-83-3 be approved, subject to the following conditions:

1. Roadway improvements to include paving and to accommodate two-way traffic shall be provided by the applicant from the Kaumualii Highway entrance to the subject site prior to the issuance of the occupancy permit.
2. The Planning Commission should reserve the right to revoke or modify the permits should the proposed use be detrimental to abutting property owners, cane haul operations, users of the school, the agriculture work-study be discontinued, or problems arise that affect the health, safety and welfare of the public.

3. As recommended by the Fire Department:
 - a) Access roadways have all-weather driving surface of not less than 20 feet of unobstructed width, with adequate roadway turning radius capable of supporting the imposed loads of the fire apparatus and having a minimum of 13 feet 6 inches of vertical clearance.
 - b) County approved water lines with fire hydrants having the required fire flow be located within 250 feet to all sections of the proposed buildings to be protected.
 - c) All buildings shall have a minimum 2-A rated ABC-type of fire extinguisher mounted 5 feet from the floor near the exit.
 - d) Comply with all other requirements of the Kauai County Fire Code.
4. Any other use of the property other than educational (i.e., church, student boarding, etc.) or agricultural-related activities shall require Planning Commission approval.
5. The applicant shall establish an architectural theme that is compatible and conducive to the area, and provide criteria to include but not be limited to single-story structures, the use of non-reflective, earth-tone colors and roof materials, and the use of exterior wood paneling and/or trim. This plan shall be subject to the review and approval of the Planning Director prior to building permit approval.
6. Applicant shall comply with the Department of Health and Public Works Department's requirements.
7. Applicant shall revise the site plan to reflect the 14.97-acre school use as one contiguous site. At such time that the school expansion use exceeds 15 acres, said expansion and use shall be subject to Land Use Commission review and approval.
8. The applicant is advised that prior to and/or during construction and use, additional government agency conditions may be imposed. It shall be the applicant's responsibility to resolve those conditions with the respective agency(ies).

By


Michael Laureta
Planner

Approved & Recommended to Commission:


Avery H. Youn
Planning Director

TONY T. KUNIMURA
MAYOR



AVERY H. YOUN
PLANNING DIRECTOR

TOM H. SHIGEMOTO
DEPUTY PLANNING DIRECTOR

TELEPHONE (808) 246-3819

COUNTY OF KAUAI
PLANNING DEPARTMENT
4280 RICE STREET
LIHUE, KAUAI, HAWAII 96766

December 19, 1983

Hawaiian Association of Seventh-Day Adventist
c/o Mr. Raymond E. Hoe
3501 Rice Street, Suite 212
Lihue, Hawaii 96766

Subject: Special Permit SP-83-1
Use Permit U-2-83
Class IV Zoning Permit Z-IV-83-3
Hawaiian Association of Seventh-Day Adventist
TMK: 2-7-01:Por. 1 Koloa, Kauai

The Planning Commission at its meeting held on December 14, 1983, approved the subject permits to relocate the Kauai Adventist School to Kahili the Mountain Park site. Approval was with the following conditions:

1. Roadway improvements to include paving and to accommodate two-way traffic shall be provided by the applicant from the Kaumualii Highway entrance to the subject site prior to the issuance of the occupancy permit.
2. The Planning Commission should reserve the right to revoke or modify the permits should the proposed use be detrimental to abutting property owners, cane haul operations, users of the school, the agriculture work-study be discontinued, or problems arise that affect the health, safety and welfare of the public.
3. As recommended by the Fire Department:
 - a) Access roadways have all-weather driving surface of not less than 20 feet of unobstructed width, with adequate roadway turning radius capable of supporting the imposed loads of the fire apparatus and having a minimum of 13 feet 6 inches of vertical clearance.

Hawaiian Association of Seventh-Day Adventist
c/o Raymond E. Hoe
Page 2
December 19, 1983

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8. The applicant is advised that prior to and/or during construction and use, additional government agency conditions may be imposed. It shall be the applicant's responsibility to resolve those conditions with the respective agency(ies).



AVERY H. YOUN
Planning Director

cc: Mayor, Pub. Works Dept., Water Dept.
Health Dept., Fire Dept., Real Property Div.

SECTION II BRIEF HISTORY AND BACKGROUND OF KAUAI ADVENTIST SCHOOL

HISTORY:

The original Kauai Adventist School started over 30 years ago, in the Kapaa vicinity. In 1975 the campus was relocated to the Omao site and has operated as a secondary school facility from that year to the present date, maintaining an open door admissions policy to the public on a selective basis. The original purpose of starting a private church school operation was to provide the members of the Kauai Adventist Churches, with congregations located in Kapaa and Lawai, a chance to send their children to a private church school where the philosophies of the Seventh-day Adventist Church was the basis for education. The initial student enrollment was modest in size, but increased during the next few years. The school year 1981/1982 showed that the enrollment had multiplied by a factor of 2.6+ times the enrollment of 1975. (See Exhibit 'B')

It was during the first part of the 1981/1982 school year that the School Board decided to evaluate its existing facilities and project its future needs. A committee was formed to undertake this study and to come up with some recommendations. The committee undertook the study of the school's present and projected needs, and came up with the following recommendations:

RELOCATION RECOMMENDATIONS

- A) Relocation of the Kauai Adventist School campus due to the following influencing factors:
 - 1) Current Need to Expand Classroom Facilities; this would require new buildings on the limited buildable site in Omao. The location is situated on a hillside property, with steep slopes.
 - 2) Parking Lot Expansion:
 - a) Auto parking lot area is limited for future expansion requirements.
 - b) School bus parking area is not adequate and is limited when incorporating all of the site needs for future expansion requirements.
 - 3) Development of Work-Study Program Potential; A total lack of useable space for the development of a much desired Work-Study Program. This program, when included in the school

SECTION II continued

educational program, would be a very important basis of the curriculum. This program would fill a need that is presently lacking in other educational institutions now operating on Kauai.

B) Based on the above listed reasons, the Committee then established criteria for finding a new campus site. The criteria were as follows:

- 1) a central location for all constituents
- 2) sufficient sized property for expansion
- 3) suitable for Agriculture and a Work-Study Program, etc.
- 4) site purchase price to be economically feasible

c) Possible sites for the relocation were listed and discussed, some of the areas looked at are as follows:

- 1) Kiluea area; not central location
- 2) Kapaa area; available lots inadequate in size
- 3) West Kalaheo area; utilities, water, power, etc. high cost of development improvements

SITE CHOICE:

The site that seemed to be the most suitable was the property called "Kahili Mountain Park". The committees' interest in the property was increased when the owners reduced their selling price by one-half the asking amount. They also stated that out of the two interested parties looking at purchasing the property, they preferred the potential of a private school facility over the other party's proposed use. This development of events was taken as a sign that the project site of "Kahili Mountain Park" was the chosen location, by Divine direction. Thus negotiation to purchase the property was entered into with the owners, Knudsen Trust et.al., for the future location of "Kahili Adventist School".

SECTION II continued

The services of the Architectural firm of Hoe/Kauahikaua and Chun, Joint Venture Architects were retained to develop a Campus Plan and to prepare the necessary documents for processing of the required permits for the County of Kauai. We, then have taken these documents and added to them for this request to the State Land Use Commissioner.

SECTION III SITE DATA

SITE DESCRIPTION:

The following information describes the subject property in detail:

Tax Map Key: (New number)
Portion of 4/2-7-01-01
(consisting of 939.014 acres)

(Parcel #8 of Proposed subdivision Map
prepared by Jame Mann, November 18, 1948)

Owner of Record: Augustus F. Knudsen Trust and Eric A. Knudsen
Trust

Lessee of Record: Hawaiian Association of Seventh-day Adventists

Land Area: Approximately 186 acres, or 133.07 net arable
acres

State Land Use Classification: Agriculture

County Zoning: Open

Topography: Moderate to medium slopes with gullies (0 to
25% slope, exclusive of gullies)

Soil Characteristics: Lawai silty clay: these soils are located at
the base of hills on the island of Kauai and
are geographically associated with Halii and
Hihimanu soils. Surface layer is approximately
14" thick of dark brown and very dark grayish
brown silty clay which is medium to strongly
acid. Permeability is moderate to rapid, run-
off is slow to medium, and erosion hazard is
slight to moderate, depending on slope. Uses
include sugar cane, pineapple, pasture, water
supply and wildlife habitat. Natural
vegetation include guave, jou, melastoma,
sensitive plant, hilograss, rice grass.

SECTION III continued

Weather: Mean Annual Rainfall: 80 to 100 inches average annual
Temperature: 72 F.

Ground Cover: Approximately 50% of the grass area is cleared of natural vegetation and is in use as pasture or sites improvements. Approximately 36 structural improvements are located on the subject property. This property was once used to grow lychee commercially, and evidence of these orchards is seen throughout the park. The remaining acreage consists of steep slope and gully land overgrown with natural vegetation.

Utilities: Water: A water transmission pipe 8" in diameter, flowing from Mt. Kahili to Koloa Town runs along the western or mountain boundaries of Kahili Mountain Park. A separate 3" water line is tapped from a cistern above the Northern most boundary and feeds into a chlorinator building, and then branches into two 2" service lines. One line services the Cabins, Cabinettes, and all ancillary camp buildings. The rest of the buildings on the site are serviced by the second line.

Electricity: All structures are wired for electricity for lighting and outlets. Power is presently supplied by Kauai Electric.

Gas: Both individual cylinders and bulk tank storage provide propane gas, serviced by Gasco, Inc.

Telephone: Only a single telephone line is provided by Hawaiian Telephone Company at this time, but an expanded phone system is being designed by Hawaiian Tele and will be installed.

SECTION IV USE PROJECTION

PROJECTED SITE USE OUTLINE:

The title of "Kahili Adventist School" was chosen as the name for the subject property. The Projected Site Use Outline and Time Table is tentatively as follows:

- 1) Relocation of the present school facility (grades 1 through 10, occupancy completed by September 1987.)
- 2) Expansion of the school program, (K through 12, Phase II, 2 to 5 years from start of Phase I).
- 3) Agriculture Work-Study Program to be implemented by Sept. 1987.
- 4) Utilization of current campground facilities to continue operation.
- 5) Future development, relocation, and expansion of campground site facilities.
- 6) Horse stables and boarding to be continued as long as it is feasible.
- 7) Health Conditioning, Physical Retreat Center, Health Museum, and Spiritual Retreat Center.

HEALTH CONDITIONING/PHYSICAL RETREAT CENTER:

The beautiful rural setting of Kahili Mountain Park is an ideal location for live-in health programs. The center will make the following health programs available:

- * A weight-loss vacation program in Hawaii
- * Learning to manage chronic pain
- * Enjoying an active lifestyle after retirement
- * Smoking cessation and alcohol recovery program
- * Cardiac conditioning and stress management
- * Support groups for cancer, asthma, etc. patients

HEALTH MUSEUM:

The health museum which will be built near the Health Conditioning/Physical Retreat Center and will offer an educational program for the residents of Kauai and guests. There will be the following displays:

SECTION IV continued

- * History of Hawaiian medicine using artifacts and pictures
- * Pictorial history of western and eastern healing techniques
- * Use of modern technology in displaying the wonders of the human body

SPIRITUAL RETREAT CENTER:

The physical setting of Kahili Mountain Park makes a religionist aware of the presence of the Creator and His love - the mountains, trees, flowers, foliage, birds, and stars. The program of the center will be:

- * How to make faith relevant to everyday living
- * To add depth to Christian commitment
- * Conversation about religion and life

AGRICULTURAL DATA:

Agricultural crop use data is currently being gathered and analyzed for future implementation. Some of the Agricultural uses being considered are as follows:

Food Products: Agriculture

- Watercress
- Banana Patch Crops
- Avocado Pear Orchards
- Lychee Orchards (upgrading of existing)
- Specialty Pineapples
- Papayas
- Nut Orchards
- Taro Patches
- Vegetable Truck Farming
- etc.

Food Products: Farm

- Eggs
- Bees, Honey
- etc.

Non-Food: Agriculture

- Landscape Plants
- Ornamentals, flowers
- Nursery Items
- Indoor plants
- etc.

SECTION IV continued

DATA SAMPLE:

(The following is a typical example of the type of information being gathered for future use.)

Example: Banana Patch Cultivation
10 year Projection
(see following Tables 1, 2, 3)

Banana Patch Cultivation
10 Year Projection

Proj.	Ac.	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.	7th yr.	8th yr.	9th yr.	10th yr.	11th yr.
1st Yr.	5	90,750	363,000	363,000	363,000	363,000	363,000	363,000	363,000	363,000	363,000	363,00
2nd Yr.	5				363,000	363,000	363,000	363,000	363,000	363,000	363,000	363,00
3rd Yr.	5				363,000	363,000	363,000	363,000	363,000	363,000	363,000	363,00
4th Yr.	10				181,500	726,000	726,000	726,000	726,000	726,000	726,000	726,00
5th Yr.	5					90,750	363,000	363,000	363,000	363,000	363,000	363,00
6th Yr.	5						90,750	363,000	363,000	363,000	363,000	363,00
7th Yr.	5							90,750	363,000	363,000	363,000	363,00
8th Yr.	5								90,750	363,000	363,000	363,00
9th Yr.	5									90,750	363,000	363,00
10th Yr.	5										90,750	
		55										

Totals	90,750	363,000	363,000	363,000	544,500	1,179,750	1,542,750	1,905,750	2,268,750	2,631,750	2,994,75
x.20 per/lb.											
Gross Rev.	18,150	72,600	72,600	72,600	103,900	235,900	308,550	381,150	453,750	526,350	598,95

Investment:											
25,800	52,920			242,000		90,000	38,000	10,000	10,000	18,000	18,00
Annual Cost:											
14,810	8,620	11,875	46,475	60,945	46,860	61,670	76,480	91,290	106,100	120,910	120,91
Acreage Cost + 1 :											
22,460	61,540										
Cash Balance:											
(22,460)	(65,850)	(5,125)	21,000	(209,345)	(147,305)	(63,025)	(137,045)	140,815	478,465	73,905	1,341,305

INVESTMENT ON EQUIPMENT

Equipment	Start-up Investment	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.	7th yr.	8th yr.	9th yr.	10th yr.
Tractor & Herro	12,000										
4WD Truck	5,000										
Farm Bldg.	Existing										
1 1/2 Ton Truck		10,000 (24ft. flat bed)		15,000 (24ft. flat bed)				20,000 (Truck Tractor)			
Power Sprayer		1,600									
Mist Blower		5,000									
Knapsack Sprayer		320									
Misc. Hand Tools		200									
Posthole Digger		600									
String Line							50,000				
Buildings:											
Packing Shed					50,000						
Reefer 20x50					95,000						
Forklift		8,000									
Packing Line & Conveyers				50,000							
Scales		5,000									
Dump Tanks		5,000									
Float Tanks		5,000									
Carts				2,000							
Tables				10,000							
Shipping Bins		10,000			20,000		40,000	10,000	10,000	10,000	10,000
Hand Tools		3,000									
Other		6,000									
Total	25,800	52,920			242,000		90,000	30,000	10,000	10,000	10,000

BANNAS COST PER ACRE					
	Per Acre Per Year	2nd Year	3rd Year	4th Year	5th Year
Land Clearing	500.00	—			
Land/Soil Prep:					
Weed Control		375.00	600.00	600.00	900.00
Material	100.00	100.00	200.00	200.00	250.00
Labor	30.00	—			
Truck	20.00	—	Trim Suckers	35.00	35.00
Planting:					
Labor-100hrs	425.00	—			
Rental	80.00	—			
Suckers 2.00 (one time only)	726.00	—			
Fertilizer-4	17.00	—			
Material	100.00	—			
Recurring Cost:					
Rent	100.00	100.00	100.00	100.00	100.00
Spray		35.00	70.00	70.00	70.00
Weed Control					
Labor-12	17.00	17.00	35.00	35.00	35.00
4WD Truck-12	17.00	17.00	35.00	35.00	35.00
Material	75.00	75.00	75.00	30.00	30.00
Fertilizing:10-10-10					
Material	150.00	40.00	60.00	800.00	800.00
Labor-8	35.00	35.00	45.00	45.00	45.00
4WD Truck-8	35.00	35.00	45.00	45.00	45.00
Acct. Labor: Bookkeeping	35.00	35.00	70.00	6,000.00	6,000.00
Insurance	500.00	500.00	500.00	1,200.00	1,200.00

Table 3

SECTION V CONDITIONS JUSTIFYING USE PERMIT

SPECIAL PERMIT # (5 point test, Land Utilization):

- 1) "Such use shall not be contrary to the objectives sought to be accomplished by the Land Use Law and Regulations." (State)
 - A) The objectives of the State Land Use Law and Regulations governing Agricultural Districts have at their heart the maintenance and development of Agriculture in Hawaii. The expressed purpose of the Kahili Adventist School will be to operate a Work-Study Program enabling students to learn practical skills. Agriculture will be utilized, focused on Agriculture, which purpose cannot be practically or economically operated within an urban district. Therefore this school operated within the demonstrated capabilities of the Seventh-day Adventist Church meets the highest objectives of the Land Use Law.
- 2) "That the desired use would not adversely affect surrounding property."
 - A) Area: Existing orchards, pastures, and new fields will surround the Institution and act as a buffer to the adjacent sugar cane fields and forest reserve. The existing recreational facilities are in operation and have not adversely affected surrounding property.
- 3) "Such use would not unreasonably burden public agencies to provide roads and streets, sewers, water drainage, and school improvements, and police, and fire protection."
 - A) The Kahili Adventist School is prepared to improve site infrastructure as facilities warrant it and as funds permit. As a perpetual educational institution the school will continually improve with the passage of time both its buildings and site. Independent private schools are not financed by bonds or by mortgages, but with donations, and school tuitions.

With respect to school improvements the Kahili Adventist School's proposed project will add a new dimension to Kauai's educational facilities.

SECTION V continued

Police protection does not present a problem as the development will be under the control of the Seventh-day Adventist Church.

Fire protection is under discussion with the department. The site already has a private water system capable of sustaining the proposed use.

4) "Unusual conditions, trends and needs have arisen since the district boundaries and regulations were established."

A) Under the Comprehensive Zoning Ordinance of Kauai County, schools are not generally permitted Uses and Structures in any district. Therefore the Seventh-day Adventist Church could not have acquired any site on the island where School Use would be allowed without a Use Permit.

Unusual conditions, trends, and needs have arisen since the creation of the Kauai Adventist School. It is not the intention of the School to supplant the public education system, but to offer what it considers a distinctive educational opportunity to its constituents and the people of Kauai County. The rapid growth of the School and the fact that some applicants have to be turned away due to lack of space is indicative of the Community support and need for new School facilities.

Among the General Purposes of the Comprehensive Zoning Ordinance is "to create opportunities for a greater fulfillment of life through the development of a broad spectrum of educational and cultural pursuits." Section 1.2(c)

5) "That the land upon which the proposed use is sought is unsuited for the uses permitted within the District."

A) As discussed in item 4a, Use Permit is being sought because schools require one in any district on the island of Kauai. The Accessory Uses to the School such as diversified Agriculture and Outdoor Recreation are all Generally Permitted Uses and Structures in the Open District.

SECTION V continued

MISCELLANEOUS QUESTIONS (Planning Department comments):

- 1) "Any access way improvements intended? If so when? To what Extent?"
 - A) The roadway surface that connects Kaumualii Highway to the subject property is being included in the present subdivision application as a flag lot section of the property. The roadway already existing is an improved and maintained Cane Haul road. This roadway surface will be maintained and kept clear at all times including during times of Cane harvesting.

Roadway improvements have been made in harmony with the fire department recommendations.
- 2) "Are 20 more new cabins intended to be constructed which were previously approved by L.U.C.? If so where? When? What future improvements are intended?"
 - A) Yes, at this time the option of building the already approved 20 new cabin structures would be retained, the location of the cabins will be determined at a later date.

All ancillary utilities would be installed at that time. (roads, water lines, sewers/cesspools, etc.)
- 3) "What is intended for existing structures and uses?"
 - A) See Exhibit 'E' (notes on drawings)

Most structures and uses will be maintained as they are currently being used, unless noted otherwise on the drawings.
- 4) "Insurance: What is agreement between McBryde and Association relative to access liability and maintenance of Cane Haul road?"
 - A) The liabilities involved in this question have been worked out between the owner Knudsen Trusts et.al., and McBryde Sugar Co.
- 5) "Present and future school population, and teachers? Will teachers be living on campus? Is this to be a School/Church/Day Care/Camp/etc?"

SECTION V continued

A) The present School enrollment is 95 students, with 6 teachers, (see EXHIBIT "D", KAS enrollment table).

The projected increase in School population through Phases I & II will be approximately 25 students per grade, 1 teacher per grade, grades 1 through 10.

Yes, teachers would have the option to live on Campus. As an interim arrangement, they may be housed in the existing Cabins. Educational Use Land has been set aside for future faculty housing, as called out on the Site Use Map.

6) "What other areas in Urban district have been considered? Why this site?"

A) See SECTION II, RELOCATION RECOMMENDATIONS

7) "Can Fire Department requirements be met?"

A) In preliminary discussions with the County Fire Department Inspector, Bill Enoka, the existing connecting Cane Haul road was thought to be adequate to allow for emergency firetruck access, if it were to be kept clear at all times. On site requirements are presently being met and reviewed by the Fire Department.

8) "Show area of use on site."

A) (See EXHIBIT 'E', 'F' & 'G')

9) "Is project to be accomplished in phases? If so provide phasing and development time table."

A) Phase One: Elementary School Buildings, Staff Housing, Cabins (20), Implement Agriculture program/work study -- 1-5 years.

B) Phase Two: Health Conditioning and Physical Retreat Center, Health Museum, Spiritual Retreat Center -- 2-7 years running concurrent with Phase One.

C) Phase Three: Secondary School expansion, capital improvements to accommodate student growth and work study, expand all programs -- 8-15 years.

D) Continue Master Plan objectives 15-30 years.

SECTION V continued

10) "Is the existing Kahili Mountain Park water system sufficient for your proposed uses?"

- A) Yes, according to our Civil Engineer's estimates, the existing water system is adequate to handle the amount of new proposed building requirements with certain expanded lines being required before occupancy of any new school building.
- B) Before phase two implementation an expanded water lines and storage facility will be needed.

SECTION VI SIMILAR SCHOOL OPERATIONS WORLD WIDE

GENERAL CONFERENCE OF SEVENTH-DAY ADVENTIST

The General Conference of Seventh-day Adventists is a world wide organization with headquarters located in Washington D. C. The church was established as an organized group in 1863, and has a membership of approximately 4 million people today. The church is a Christian organization that places an important emphasis in the fields of Education, Health, and Medical Sciences. A large part of Church philosophies is focused on humanitarian efforts throughout the world. Through the field of Education in their own private church schools, members are prepared to function as valuable citizens in any society. Their spiritual needs are also addressed in this educational process. An educational triad of the Mental, Physical, and Spiritual development of the individual forms the basis of a well rounded, total educational philosophy.

WORLD WIDE INSTITUTIONS:

World wide educational institutions run by the Seventh-day Adventists include the following Divisions:

Universities and Colleges:

- Africa-Indian Ocean Division	6 institutions
- Australolian Division	4 institutions
- Eastern Africa Division	4 institutions
- Euro-Africa Division	10 institutions
- Far Eastern Division	13 institutions
- Inter-American Division	9 institutions
- North American Division	12 institutions
- Northern European Division	8 institutions
- South American Division	6 institutions
- Trans-Africa Division	5 institutions
- Middle East Union	1 institution

World Totals: 1982
Universities and Colleges

82 Schools

SECTION VI continued

Secondary Schools:

- Africa-Indian Ocean Division	25 institutions
- Australiian Division	42 institutions
- Eastern Africa Division	104 institutions
- Euro-Africa Division	12 institutions
- Far Eastern Division	121 institutions
- Inter-American Division	95 institutions
■ North American Division	337 institutions
- Northern European Division	10 institutions
- South American Divisions	43 institutions
- Southern Asia Division	39 institutions
- Trans-Africa Division	15 institutions
■ Middle East Union	46 institutions

World Totals: 1982

Secondary Schools 889 Schools

HAWAIIAN CONFERENCE OF SEVENTH-DAY ADVENTIST

The local membership in Hawaii was established in 1895 and organized in 1918. The first Adventist church school institution to operate in Hawaii was called "Hawaiian Mission Academy" and was established in 1915. This school is still in operation today, and has a campus located in the city of Honolulu, on the island of Oahu. The following is a list of all the elementary and high school facilities located in the state of Hawaii.

- Hawaiian Mission Academy
1438 Pensacola Street
Honolulu, Oahu, Hawaii
- Hawaiian Mission Elementary School
1415 Makiki Street
Honolulu, Oahu, Hawaii
- Kailua Mission Elementary School
160 Mookua Street
Kailua, Oahu, Hawaii
- Kauai Adventist School
P. O. Box 480
Lawai, Kauai, Hawaii

SECTION VI continued

- Leeward Adventist Mission School
1313 California Avenue
Wahiawa, Oahu, Hawaii
- Maui Mission Seventh-day Adventist School
261 South Puunene Avenue
Kahalui, Maui, Hawaii
- Mauna Loa School
172 Kapiolani Street
Hilo, Hawaii, Hawaii
- Kona Adventist School
739 Captain Cook Highway
Captain Cook, Hawaii, Hawaii
- Kohala Mission School
P. O. Box 130
Kapaau, Hawaii, Hawaii
- Molokai Mission School
248 Kaunakakai Street
Kaunakakai, Molokai, Hawaii

Most of the educational facilities listed above are urban institutions, and do not offer any type of work-study program in agriculture or any other vocation. This lack of a work-study program is due to the limitations of the urban properties. Cost and availability of lands in which to expand the school curriculum to include such programs are prohibitive on Oahu. It is hoped that with the rural nature of the Island of Kauai, such programs can be developed to benefit the coming generations.

SIMILAR WORK-STUDY PROGRAMS:

Examples of similar proposed work-study programs can be found in the North American Division schools such as the following:

- Milo Academy, Oregon
- Monterey Bay Academy, California
- Rio Lindo Adventist Academy, California
- Thunderbird Adventist Academy, Arizona

These schools provide different programs in which the students can participate in a work-study mode while achieving their academic requirements. The following is an excerpt describing the work-study philosophy, taken from the Student Handbook of Thunderbird Adventist Academy:

SECTION VI continued

"Thunderbird Adventist Academy believes that work was appointed to man as a blessing, to strengthen his body, to expand his mind, and to develop his character. Therefore, it endeavors to provide classroom training in the development of vocational skills as well as to teach students the discipline of systematic well-regulated labor as an essential aid to their well-rounded development.

In order to teach youth to accept responsibility and to form work habits adaptable to any field of endeavor while awakening in the student a genuine interest in his work and desire to do the job in the best possible manner, plus showing that results can be achieved through skillful intelligent effort."

It is the intent of the proposed Kahili Adventist School, to emulate the goals and high ideals set forth by its sister institutions, such as Thunderbird Academy, in developing a sound and successful Agricultural and Work-Study Program.

SECTION VII CLOSING STATEMENT

Kahili Mountain Park, with its natural tranquil qualities, can become the ideal setting for the educational development of future generations of a portion of Hawaii's youth. A valued education with an agricultural background, such as this site can offer, potentially one of the state's great untapped natural resource. It is hoped that such endeavors would be granted a chance to succeed and thus benefit the rest of society in the process.

SECTION VIII LETTERS OF SUPPORT

The following letters of support are included in this permit application document as a sample of public service achievements attained by alumnus of Hawaiian Mission Academy.

(see following letters, next sheets)



OFFICE OF THE LIEUTENANT GOVERNOR
STATE CAPITOL
HONOLULU, HAWAII 96813

JOHN WAIHEE
LIEUTENANT GOVERNOR

October 19, 1983

(808) 548-2544

Mr. Avery Youn, Director
Planning Department
County of Kauai
4280 Rice Street
Lihue, Hawaii 96766

Attention: Mr. Michael Laureta, Planner

Dear Sir:

I have been asked to write a letter in support of Kauai Adventist School's plans to build a school at the Kahili Mountain Park Site.

If there are no major permit difficulties, I would like to heartily endorse this project. As a graduate of Hawaiian Mission Academy in Honolulu, I am aware of the outstanding work of the Seventh Day Adventist Church in the fields of education and health (Castle Memorial Hospital) in the State of Hawaii.

I understand that the current Kauai Adventist School is inadequate and that the proposed school would meet the needs of an increasing enrollment, would offer an improved physical environment and would facilitate a wider range of educational opportunities, including an extension of the grade levels and an agricultural work study program.

Given the Seventh Day Adventist's proven record of community service and effective program management, I respectfully request your favorable consideration of this project.

Very truly yours,

A handwritten signature in black ink, appearing to read "John Waihee".

JOHN WAIHEE
Lieutenant Governor

JW:CF:gs

cc: Mr. David Hoe

HOE, YAP & PABLO

ATTORNEYS AT LAW

SUITE 1000 • 333 QUEEN STREET
HONOLULU, HAWAII 96813

Allen K. Hoe
Frank Yap, Jr.
Christopher G. Pablo

TELEPHONE (808) 521-6927

OF COUNSEL
Marjorie Higa Manuia

October 17, 1983

Mr. Avery Youn
Director
Planning Department
County of Kauai
4280 Rice Street
Lihue, Hawaii 96766

Attention: Michael Laureta, Planner

Re: Proposed Kauai Adventist School at
Kahili Mountain Park

Dear Sir:

I would like to offer my whole-hearted support for the proposed development of the Kauai Adventist School Complex at Kahili Mountain Park. I offer this support as an alumnus of the Hawaiian Mission Academy, Class of 1965.

The history of the Adventist educational programs in Hawaii is long and highly respected. The contributions by its faculty members, students, as well as alumni, have been many. The school programs which offer an excellent alternative Christian education for citizens of Hawaii deserve the support and assistance from everyone within that community. As a parochial school, its educational programs and the unselfish assistance it provides to the community without regard to individual religious preference is highly commendable.

The efforts of the Kauai Adventist Church in contributing to the overall health and welfare of the Kauai County through its many civil assistance projects, work aid, along with disaster relief and its community health education programs are too numerous to mention.

The present location of the school inhibits the continued development and growth of this program. The Kahili Park opportunity, presented to the members of the Kauai Adventist community, is certain to enhance the educational program as well as contribute to the Kauai community at large. Kahili Mountain Park is an ideal location for this church school program.

Mr. Avery Youn, Director
Attn: Michael Laureta, Planner
October 17, 1983
Page Two

Re: Proposed Kauai Adventist School at Kahili Mountain Park

Your favorable consideration of the request by the Kauai Adventist community will be greatly appreciated not only by them but by many other individuals throughout the State of Hawaii who whole-heartedly support the educational programs which are being proposed for the Kahili Mountain Park Educational Complex.

Pau,

Allen K. Hoe

ALLEN K. HOE

AKH:phs

P.S. In addition to my private law practice, I am a Per Diem District Court Judge of the First Circuit, State of Hawaii.

APPENDIX

EXHIBIT: 'A' Island of Kauai

EXHIBIT: 'B' Plot Plan

EXHIBIT: 'C' Special Permit, Use and Class IV Zoning Permit, original application, dated May 1982, Reference No: S-84-5

EXHIBIT: 'D' Kauai Adventist School Enrollment Table, 1975 -- 1986

EXHIBIT: 'E' Existing Site Zoning

EXHIBIT: 'F' Proposed Site Zoning

EXHIBIT: 'G' Proposed Development of Master Plan

EXHIBIT 'A'

- Island of Kauai

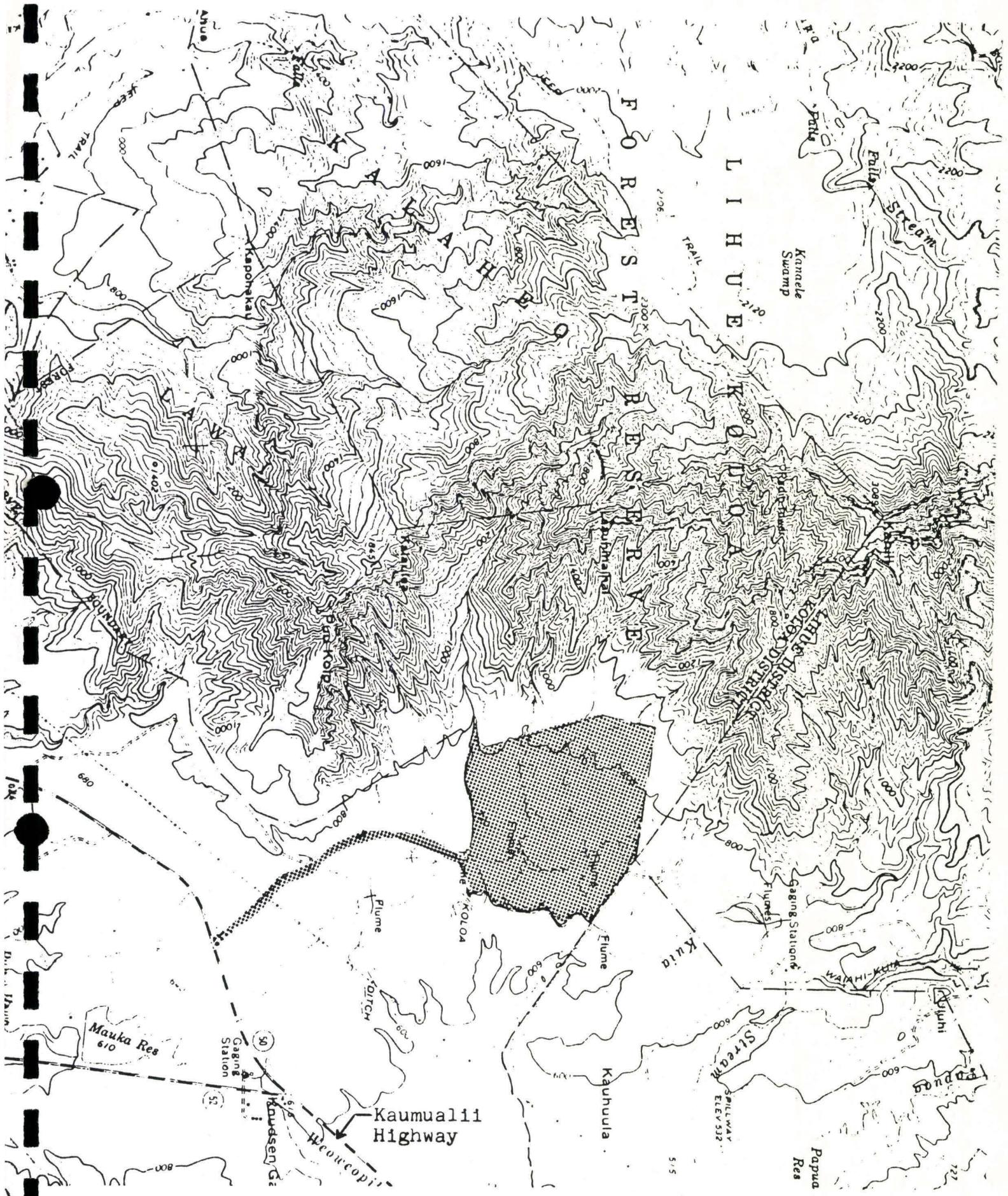


Project Location

Island of Kauai- Exhibit A

EXHIBIT 'B'

• PLOT PLAN



Plot Plan
Exhibit B

EXHIBIT 'D'

KAUAI ADVENTIST SCHOOL ENROLLMENT TABLE, 1975 - PRESENT

KAUAI ADVENTIST SCHOOL

ENROLLMENT 1975 - PRESENT

GRADE	1975-76		1976-77		1977-78		1978-79		1979-80		1980-81		1981-82		1982-83		1983-84		1984-85		1985-86	
	SDA	NON	SDA	NON	SDA	NON																
1	9	0	10	0	4	0	3	3	4	1	4	4	5	4	7	2	6	4	6	2	4	7
2	1	0	6	0	7	0	5	1	3	1	4	0	4	7	5	4	3	5	2	5	4	4
3	7	0	6	0	7	0	5	0	6	0	4	0	5	1	4	6	5	6	3	6	3	4
4	3	0	6	0	7	0	6	0	6	2	4	3	3	0	5	1	4	5	4	6	2	7
5	3	0	6	0	7	0	6	2	8	0	5	5	5	6	3	0	4	2	6	6	5	9
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7	2	0	4	0	4	0	3	1	5	2	6	1	5	5	4	3	4	7	4	6	1	7
8	1	0	3	0	3	0	4	0	2	2	3	3	4	5	4	3	5	3	5	11	5	3
9	0	0	0	0	0	0	2	0	0	0	0	0	3	4	3	3	5	6	1	12	5	10
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	2	2	5	7	1	4
SUB	29	0	41	0	44	0	38	9	41	8	35	18	39	37	45	38	43	44	40	63	36	60
TOTAL	29		41		44		47		49		53		76		83		87		103		96	

EXHIBIT 'E'

- EXISTING SITE ZONING

COUNTY OF KAUAI
PLANNING DEPARTMENT
LIHUE, HAWAII

ZONING PERMIT APPLICATION USE PERMIT APPLICATION VARIANCE PERMIT APPLICATION SPECIAL PERMIT APPLICATION SMA PERMIT APPLICATION

APPLICANT Hawaiian Association of Seventh-day
c/o Raymond E. Hoe Adventist
ADDRESS 3501 Rice St, S212

Lihue, HI 96766

PHONE NO. 245-8515 TAX MAP KEY 2-7-01:01portion of LOT NO.49A, 50 LOT SIZE 215 acres

ZONING DISTRICT Open EXISTING LAND USE Campground resort

APPLICANT IS: (check one)

A. Owner of property _____ As defined by Ordinance No. 317.
B. Lessee of property _____ *Number of Years Leased _____ From _____ To _____
C. Authorized agent Attach letter of authorization.

NOTE: *Lessee must have an unexpired and recorded lease of five (5) years or more from date of filing this application.

DESCRIPTION OF PROPOSED USE, IMPROVEMENT, ALTERATION AND/OR CONSTRUCTION: (specify exact use, number of units, etc.) Description of Proposed Use: The goal of the applicant is to relocate its present school facility (Kauai Adventist School, grades 1 thru 10), from its present Omao site to the subject property. It is the plan and

OR VARIANCE OR USE PERMITS ONLY

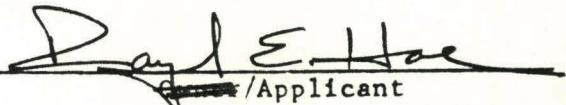
(continued see attached sheet)

CONDITIONS JUSTIFYING VARIANCE OR USE PERMIT APPLICATION: (use additional sheets as required)

SEE ATTACHED SHEET

July 18 1982
LAND USE COMMISSION
STATE OF HAWAII

Signature


Raymond E. Hoe /Applicant

For The Hawaiian Association
of Seventh-Day Adventist

Permit Fee \$50.00
Received By 1af
Date Rec'd. 7/28/82

EXHIBIT C

7-26-82

Use Permit and Class IV Zoning Permit Application
Hawaiian Association of Seventh-Day Adventist
Kahili Mountain Park Site
Page 2

goal of the school to expand it's education facilities from Kindergarten through grade 12. A high priority goal of the school is to develop an agricultural work-study program for its students.

Improvement

Sitework improvements will be limited to those areas of construction for the school site as delineated on the attached map. Electrical power is provided to the site by Kauai Electric Company; water is available under the lease provisions from the lessor. Access to the site from the highway is over the same road used by the present lessee of the site, Kahili Mountain Park, Inc.

Alteration and/or Construction

There are no specific construction drawings being developed at this time in view of the fact that one of the conditions of the purchase of the subject site is that the County and other governmental agencies grant approval for the development of a school facility. We have developed our conceptual building needs criteria for the school plant, based on a Kindergarten through grade 12 program. They are as follows:

<u>Facilities</u>	<u>Size</u>	<u>Total Square Feet</u>
(10) Classrooms	30' x 30'	9,000
Library	30' x 50'	1,500
Gymnasium	80' x 100'	8,000
Secretary's Office	15' x 15'	225
Principal's Office	15' x 15'	225
Health Room	10' x 10'	100
Teacher's Work Room	15' x 20'	300
General Storage	15' x 20'	300
Audio-Visual Storage	10' x 15'	150
(2) Bathrooms	15' x 15'	450
(2) Bathrooms (In classrooms)	5' x 8'	80
	TOTAL	20,030 Square Feet

Use Permit and Class IV Zoning Permit Application
Hawaiian Association of Seventh-Day Adventist
Kahili Mountain Park Site
Page 3

In addition to these facilities, faculty, staff, and student housing residences will be required.

Full development of the school facilities will be dependent upon the success of raising the funds needed. It is anticipated that the building program will be done in phases and may involve alteration to some of the existing structures to accommodate the school's needs.

CONDITIONS JUSTIFYING USE PERMIT APPLICATION

Applicant's Interest in Subject Property

Kahili Mountain Park, Inc., has entered into an agreement to sell the leasehold interest of the subject property to the Hawaiian Association of Seventh-day Adventists. Kahili Mountain Park, Inc. has further authorized the Hawaiian Association of Seventh-day Adventists to apply for the Use Permit and Class IV Zoning Permit. (Exhibit A)

Applicant's Reasons for Requesting Use Permit and Class IV Zoning Permit

The Kapaa and Lawai Valley Seventh-day Adventist churches along with the Hawaiian Mission of Seventh-day Adventists who own and operate the Kauai Adventist School in Omao unanimously desire to see the relocation of our school facilities to Kahili Mountain Park site. With the growth of our student enrollment and the desire to improve the environment of the school, along with the development of a work-study program particularly in the field of agriculture, we find that the Kahili Mountain Park site more than adequately fills our present and future needs. We feel that the proposed use will not conflict with the concern of the "Open Districts" of the Comprehensive Zoning Ordinance of Kauai.

Kahili Mountain Park Inc
P.O.Box 298, Koloa, Hi 96756

Hawaiian Association of
Seventh-day Adventists
2728 Pali Highway
P. O. Box 4037
Honolulu, HI 96813

ATTENTION: Mr. Shigenobu Arakaki,
President

Dear Mr. Arakaki:

Kahili Mountain Park, Inc. hereby authorizes Raymond E. Hoe, on behalf of the Hawaiian Association of Seventh-day Adventists, to submit, process and obtain all necessary governmental approvals for the development of a private school and accessory facilities owned and operated by The Hawaiian Mission of Seventh-day Adventists on that parcel of land known as Kahili Mountain Park, Koloa, Kauai, Hawaii, Tax Map Key: 2-7-01:01 portion of.

Very truly yours,

Kahili Mountain Park, Inc.

By Valdemar Knudsen
Its President

May 14, 1982

LAND USE COMMISSION
STATE OF HAWAII

JUN 18 2 25 PM '87

EXHIBIT 'C'

Special Permit, Use and Class IV Zoning Permit, original application,
dated May 1982, Reference No: S-84-5

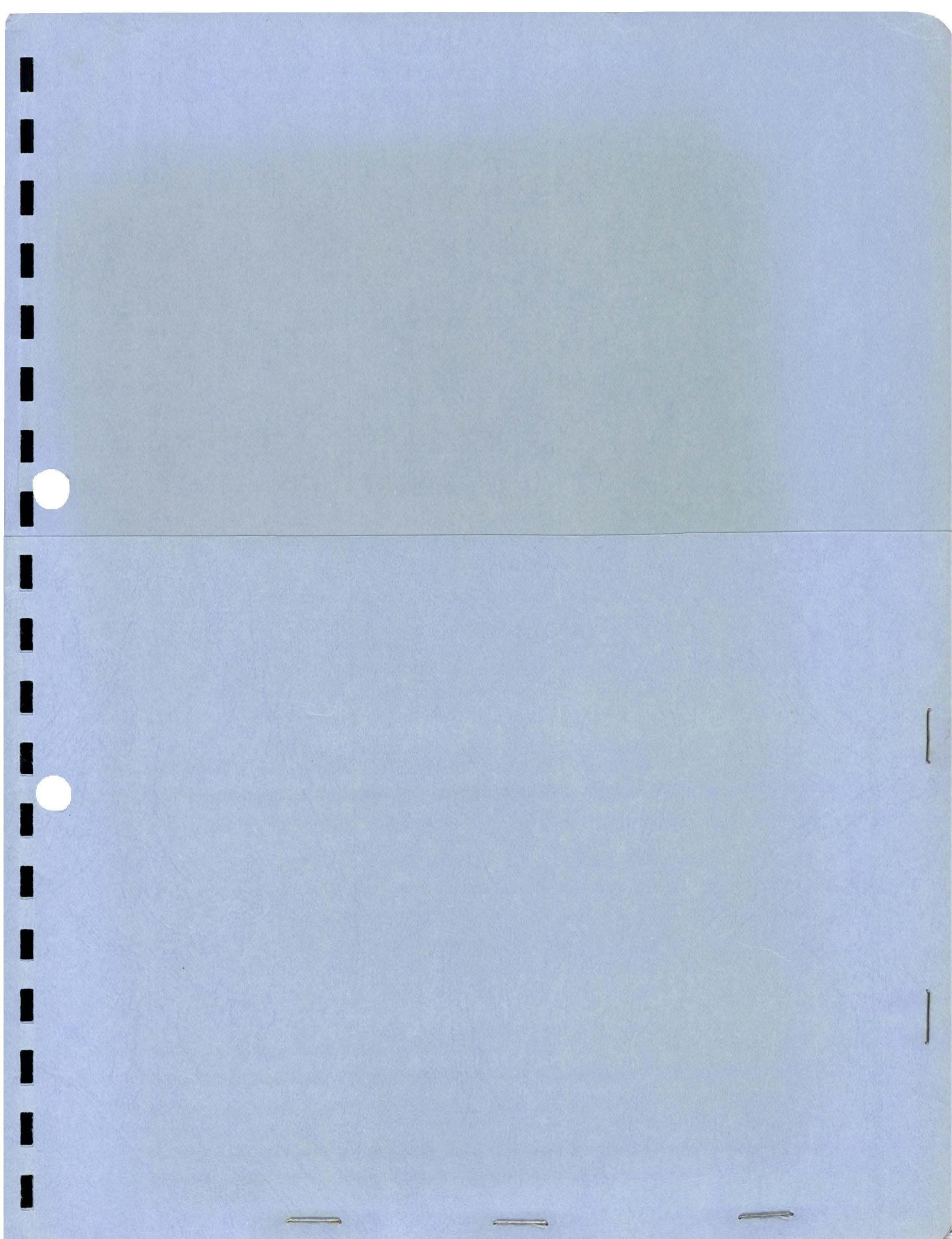


EXHIBIT 'F'

- PROPOSED SITE ZONING

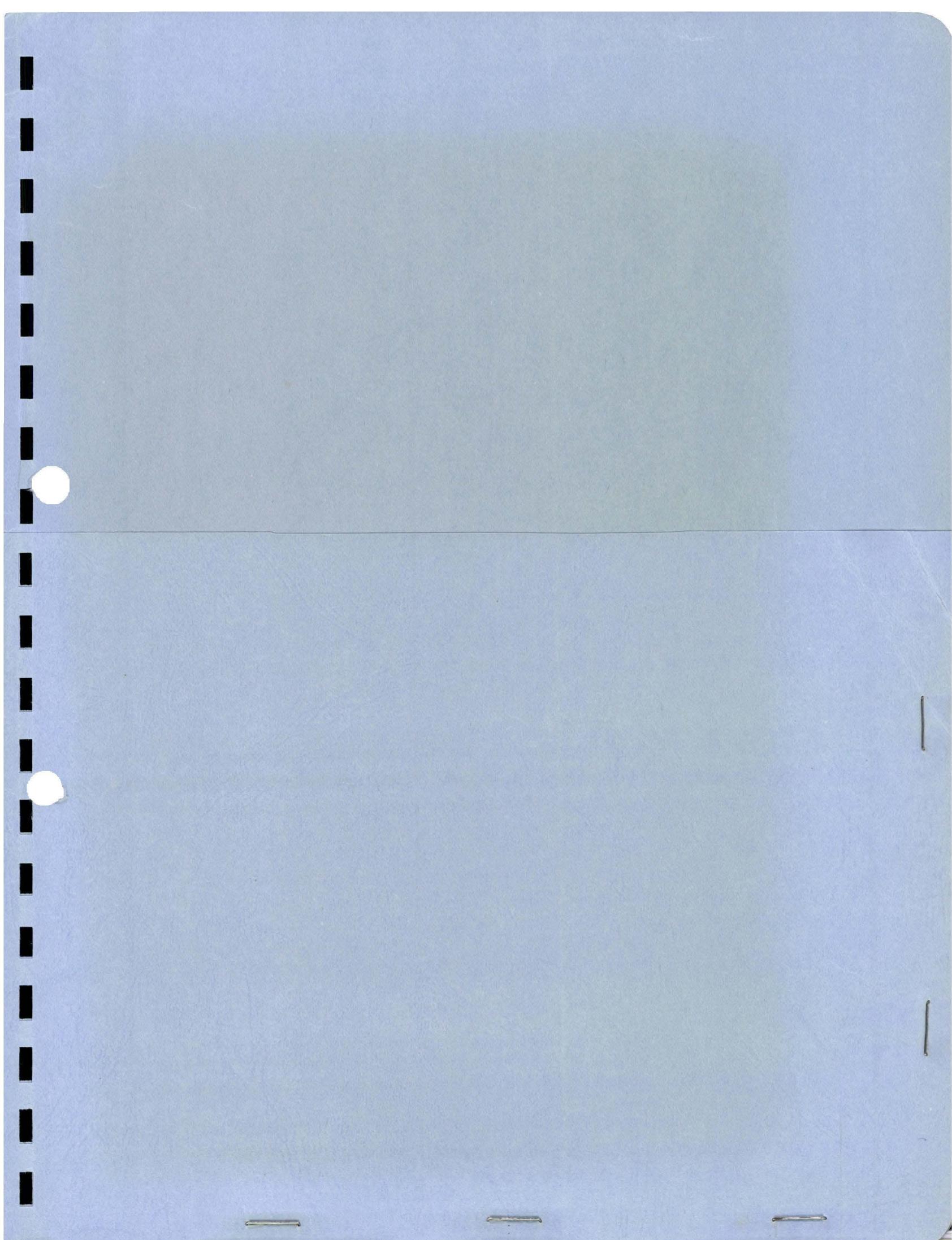
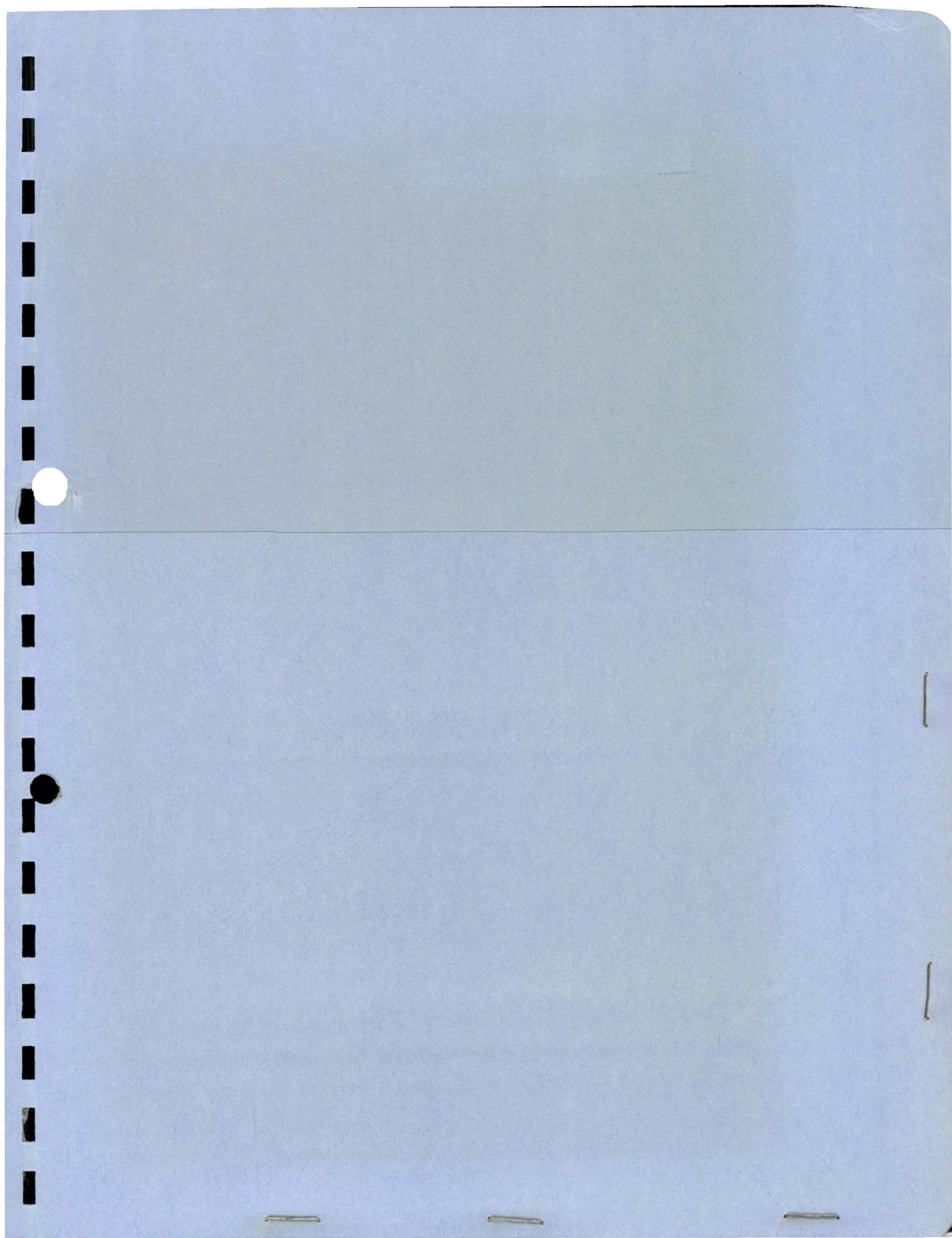


EXHIBIT 'G'

- PROPOSED DEVELOPMENT



ORIGINAL



BEFORE THE LAND USE COMMISSION
STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. SP87-364
KAHILI ADVENTIST SCHOOL)
) ORDER REQUIRING THE FILING OF
) STATUS REPORTS
For an Amendment To The Special Use)
Permit Which Establishes a Church,)
School, and Related Uses on)
Approximately 195.673 acres of Land)
within the Agricultural District Koloa,)
Kauai, Tax Map Key Number: 2-7-01:03)
)

In the Matter of the Petition of) DOCKET NO. SP87-364
KAHILI ADVENTIST SCHOOL)
) ORDER REQUIRING THE FILING OF
) STATUS REPORTS
For an Amendment To The Special Use)
Permit Which Establishes a Church,)
School, and Related Uses on)
Approximately 195.673 acres of Land)
within the Agricultural District Koloa,)
Kauai, Tax Map Key Number: 2-7-01:03)
)

ORDER REQUIRING THE FILING OF STATUS REPORTS

On August 8, 2008, Kahili Adventist School provided a written status report on its compliance with the conditions of its Special Permit to the Land Use Commission (Commission) at the Commission's meeting in Honolulu, Oahu, Hawai'i, and its efforts to seek amendments to some Special Permit conditions from the County of Kauai. Mark Valencia Esq.; Greg Kamm, Greg Kamm Planning & Management; Ronald Lindsey; and Wanda Lee appeared on behalf of the Applicant. Brian Yee, Esq.; Abby Mayer; and Abe Mitsuda were also present for the State Office of Planning.

At the meeting, the applicant provided information on its efforts to work with the Kauai County Planning Department and the State Department of

shall file with this Commission a status report describing its filing of an application for amendment of Special Permit conditions for the above-entitled docket with The County of Kauai, when the application has been filed; and shall file with the Commission within one year from the date of the filing of said application, a second status report describing the results of that filing.

Transportation to enable it to comply with some of the conditions of the Special Permit and seek amendments giving it relief from other conditions. The applicant also expressed its willingness to provide a status report when it filed its application with Kauai County for amendment of Special Permit conditions, which Applicant indicated it proposed to do within 45 to 60 days.

Following discussion by the Commissioners, a motion was made and seconded that Applicant shall file a status report with the Commission when it submits its application to the County of Kauai for amendment of Special Permit conditions, and shall file another status report with the Commission within one year of the filing of the application for amendment of conditions with Kauai County, to inform the Commission of the results of that action. Following further discussion by the Commissioners, a vote was taken on the motion. There being a vote tally of 7 ayes and 1 absent, the motion carried.

ORDER

Having duly considered the Applicant's status report, the arguments of the parties in this proceeding, and a motion having been made at a meeting conducted on August 8, 2008, in Honolulu, Oahu, Hawai'i, and the motion having received the affirmative votes required by section 15-15-13, Hawai'i Administrative Rules, and there being good cause for the motion, this Commission hereby ORDERS that the Applicant

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. SP87-364
KAHILI ADVENTIST SCHOOL)
For an Amendment To The Special Use)
Permit Which Establishes a Church,)
School, and Related Uses on)
Approximately 195.673 acres of Land)
within the Agricultural District Koloa,)
Kauai, Tax Map Key Number: 2-7-01:03)

Done at Honolulu, Hawai'i, this 26th day of

August, 2008, per motion on August 8, 2008.

APPROVED AS TO FORM

Wiane Glicks

Deputy Attorney General

LAND USE COMMISSION
STATE OF HAWAII

By 
DUANE KANUHA
Chair

CERTIFICATE OF SERVICE

I hereby certify that a copy of the ORDER REQUIRING THE FILING OF STATUS REPORTS was served upon the following by either hand delivery or depositing the same in the U. S. Postal Service by regular or certified mail as noted:

Filed and effective on
AUG 26 2008

Certified by:



DEL. ABBEY MAYER, Director
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804-2359

BRYAN C. YEE, Esq.
Hale Auhau, Third Floor
425 Queen Street
Honolulu, Hawaii 96813

MATTHEW PYUN, Esq.
County of Kauai
4444 Rice Street, Suite 220
Lihue, Hawaii 96766

IAN COSTA, Director
Department of Planning
County of Kauai
4444 Rice Street, Suite A473
Lihue, Hawaii 96766

CERT. MARK VALENCIA, Esq.
Case Lombardi & Pettie
Pacific Guardian Center
737 Bishop St. #2600
Honolulu, HI 96813

CERT: MICHAEL D. TOM, Esq.
Tom Petrus & Miller
1164 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dated: Honolulu, Hawaii, AUG 26 2008.



Orlando Davidson
ORLANDO DAVIDSON
Executive Officer