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GEOTHERMAL FOOD PROCESSING IN NEVADA (BRADY HOT SPRINGS)

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Located at mile post 65 on Interstate 80 is an abandoned swimming pool. This is all that remains of the old Brady Hot Springs Spa. Tourists often times stop and wonder where the hot springs are. The springs are still there; however, they are not visible and are no longer used for health and recreation but as a source to help feed this hungry world.

Approximately 100 yards North of this old swimming pool is a new metal building that is 600 feet long and 125 feet wide. Inside this building is the world's first Geothermal Food Dehydrator. The primary product at this time is onions. However, they have experimented with celery, carrots, green beans and potatoes.

The geothermal water used in this plant is supplied from a well designated as Brady #8. This well supplies 250 degree F. hot water at a rate of 712 G.P.M. The pump providing this water is a 15 stage, 50 h.p. vertical drive pump with the inlet set at 260 feet below grade. The hot water is delivered to the plant via a 6" insulated pipe line located above the ground. The water is then circulated through the ten dryer coils. Each coil's temperature is controlled by a pneumatic ball valve which maintains a set temperature in each of the dryers compartments. The spent hot water is discharged into the abandoned swimming pool through an 8" pipe line. An automatic pressure valve on this line maintains a 150 p.s.i. back pressure throughout the system, therefore eliminating any flashing. Silica build-up is eliminated and maintenance on valves and coils is held to a minimum.

The product is dryed in a 190 foot long, 3 stage, Proctor & Schwartz, continuous flow food dehydrator. The drying is accomplished by passing geothermally heated air through a perforated stainless steel belt. Air travel is either forced up through the product or down into the product. Air circulation is provided by fifteen Axi-vane fans. Eight fans are required at the inlet and seven at the outlet.

The geothermal heat is transferred into the drying air by ten steel tube hot water heating coils. These coils were engineered, designed and manufactured for this application by Aero-Fin Corp. Each coil has a vent valve and an automatic drain valve in the event there is a failure at the well. The coils will drain automatically to prevent any damage due to freeze up. The tubes on the coils can be rodded or serviced without completely disassembling the entire dryer. The entire piping system is welded and flanged to avoid any possibility of leakage that occurres when screwed fittings are used. Ball valves are used throughout the system in lieu of using gate or globe valves. Again, ease of maintenance and longer life is the reason behind this choice.

House heat is provided by a bank of coils located high on one wall of the processing end of the building. The spent geothermal water from the process coils is routed through these coils when there is a call for heat in the building. The air drawn through these coils is make-up air for the dryer fans. The air temperature to be maintained with an ambient outdoor temperature of -20 degrees F. is approximately 40 degrees F. - or high enough to prevent any freeze up in the piping or coils. Pneumatic control valves in the air stream on the discharge end of the coil throttles the amount of hot water required. These valves are controlled by temperature sensors located in the air stream on the down stream side of the coils

In June 1979, the Nevada Health Dept. granted Geothermal Food Processor, Inc. through a variance, the right to use the geothermal water from a shallow well near the plant for plant and process water. This well, known as Dommer #1, produces water at temperatures of approximately 210 degrees F. The temperature of this water is lowered to a useable temperature by passing it through two air cooled

cooling towers. From the towers it is stored in a 15,000 gallon fiberglass storage tank. Water in this tank is also used for fire protection. Referring to the water being used as process water, it never is used as part of the final product, it is used only as wash water. Washing any dirt or foreign material off the raw material is the first step in the manufacturing process. Plant water is used for plant wash down and for use in the toilet rooms. Bottled water and coolers are provided for the employees drinking water. It was found that by using geothermal water as wash water no silica or arsenic residue was found on the finished product. This finding prompted the issuance of the variance.

The use of a geothermal heating system is advantageous as it eliminates the possibility of fire hazard in the dehydration plant because there is no open flame to cause any combustion. Also, there are no products of combustion in the air stream that could discolor the product or contaminate it in any way. By using geothermal heat in this plant it not only eliminates the use of natural gas or other energy sources, it also eliminates the use of an expensive standby fuel back-up system. Another well is used for this purpose. It can be activated in just a matter of minutes in the event the main well is forced off the line for some reason. With this type of back-up there is very little, if any, loss in production. In essence, Geothermal Food Processors will always have the B.T.U.s that they require to manufacture their product regardless of fossil fuel shortages and their availability in the future. Geothermal energy has one other distinct advantage and that is that it replenishes itself. It does this through the descent of ground water into geologic formations where it is reheated. Some loss is experienced through evaporation but this is made up by rainfall. An almost endless source of energy is available from geothermal hot water and plants like this one can have a very important impact on the production of food in the future.

Geothermal Food Processors and Geothermal Energy Corporation have plans to add other uses for geothermal energy to the present use in this area. These uses are quite numerous and cannot be disclosed at this writing. However, if these are as successful as the Dehydration Plant we can expect some good things to rise out of an old health and recreation spa located in the Nevada Desert.