

**Business Plan for Ag Conversions Units**

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## I. Abstract

Pig waste and its management, global problems which directly contribute to the rising costs of pork production, have typically been addressed through the application of aeration lagoons and large spray systems, processes that consume months before acceptable pathogen and bacteria levels are achieved for disposal. While these lagoons and spray systems do contend with pig waste decomposition and disposal, they do not address the resulting strong offensive odors or growing potential for environmental effects such as pathogen leaks into water supplies; soil contamination and aquifer damage; and the spread of dangerous diseases.

Ag Conversions has re-examined methods for hog waste disposal and developed a cost-effective procedure for converting pig waste on a continuous basis to liquid or granulated High Efficiency Organic Fertilizer (HEOF). The Ag Conversions system can be scaled based on farm size and number of hogs, ranging from a single ton of hog waste to over hundreds of tons processed per hour. Odors associated with pig waste, caused by the microbial decomposition of volatile compounds contained in manure, are limited or entirely eliminated through the addition of organically derived chemicals in the conversion process.

The focus of this Interactive Qualifying Project (IQP) aimed to organize the rapid influx of information regarding the development and implementation of the Ag Conversion Units and chemicals, as well as the detailed process employed in the conversion of hog waste to High Efficiency Organic Fertilizers. Established was a thorough business plan for South Dakota in which each level of implementation was examined, questioned, and then further developed in order to provide the most resonate of methods for the execution and fulfillment of the units.

## II. Background

The intention of this project was to develop a model for a specific business start-up, and required the evaluation of Ag Conversions; the market in which it would be playing; and how Ag Conversion HEOF would fit into it. Each merited in-depth research into fertilizer content and types; the fertilizer process; nutrient recycling; hog cycles; and the hog industry

The unique conversion unit, process, and chemicals were developed by Dr. Mohsen Amiran in partnership with two South Korean companies: KleanEnvi and Shin Young E&I. This process converts raw hog manure into either liquid or granulated High Efficiency Organic Fertilizer (HEOF), using chemicals developed by BioGenesis Enterprises and machines developed by KleanEnvi and Shin Young E&I. This process yields a product that is both eco-friendly and cost-effective.

The introduction of HEOF into the fertilizer market demands the product have clear, competitive advantages. To better understand how HEOF fits into the market, both inorganic and organic fertilizers were examined in detail, specifically the advantages and disadvantages of both, and how HEOF would compare.

Inorganic fertilizers, derived from mined rock phosphate, potash, and ammonia, are used extensively throughout the world because of the ease of large-scale production and have supported massive worldwide population growth and food abundance, especially when considering the specialization of fertilizers for crops. Due to the required mining, use of natural gas, and high energy costs for ammonia production (Sawyer, 2001), inorganic fertilizer production is truly not sustainable. Year to year fluctuations in price of natural gas and minerals directly influences fertilizer prices, as outlined in Farm Fertilizer Prices (attached excel file). Application of non-natural fertilizers decreases long-term soil fertility, particularly when over used (Harris, 2005) as demonstrated within the borders of India where over-fertilization has depleted the land and resulted in dependence on importing food (Anand, 2010).

Organic fertilizers have been used for centuries in various forms and can be derived from a variety of possible sources ranging from decomposed plant material to cow manure, even to human waste as exemplified by farms in Asia (F. H. King, 1911). An aid to soil fertility and biodiversity (Karin Enwall, 2005), organic fertilizers are, in addition to requiring little energy, also sustainable and natural sources of nutrients. Concerns exist regarding harmful bacteria and pathogens which may occur as a result of faulty composting practices. Requiring a long production period ranging from weeks and months according to natural decay, the time-cost of organic fertilizers is rather expensive.

HEOF, a sustainable solution with a lower cost of production, a more stable price, and independent from high energy processes, mined minerals, and natural gas, was found to meet many of the issues presented regarding both inorganic and organic fertilizers. Cheaper to produce than organics and synthetic fertilizers alike, HEOF offers to the soil rejuvenation through applications of organic matter and perfect nutrient content. Hog manure processing destroys petulant pathogens, and at the same time,

additives are introduced for optimal nutrient content. Combined with the strict diet set for pigs by farmers, this leads to a more reliable nutrient content than organic fertilizers, and tests performed indicate a much higher crop yield than regular fertilizers (Kleanenvi, 2009).

Production and marketing of HEOF requires an intimate understanding of fertilizer supply and demand. It is essential to know the potential input of hog waste as raw material for HEOF production: each hog produces on average ten pounds of waste per day. When considering a market consisting of farms with over five thousand hogs, generation of fifty thousand pounds of waste at least would occur. A seemingly never-ending supply of raw material, the limiting factor for production is conversion chemicals. The level of demand for HEOF is determined directly by level of purchase interest, much of which will be influenced by the success of gaining the attention of farm bureaus that have the ability to plant the seeds of HEOF amongst the farming community.

Hog cycles and types of hog produced, namely farrow-to-finish, feeder, and finisher operations, must also be considered, as each has different decisions regarding hog production (Haley, 2009). Any single producer will employ a single method of production, but all end with hogs sent to market. Means of slaughter differentiate based on the method: farrow-to-finish operations will raise pigs from birth to slaughter, averaging two-hundred and forty pounds; feeder operations will raise pigs from birth to a mid-weight of approximately sixty pounds; and finisher operations will raise feeder pigs until reaching slaughter weight and then sell them.

In farrow-to-finish operations, a producer will have a stock of pigs with varying weights depending on date of birth. Pork prices cause a farmer to hold back a certain number of pigs for breeding while sending another number to slaughter or purchasing feeder hogs to maintain a sustainable population. In feeder operations, producers will have a stock of pigs between birth weight and sixty pounds, and decisions are based on pig inventory and pork prices: buy more pigs when prices are down, selling more mature pigs when prices are up. Finishing operations will have stocks of pigs between sixty pounds and slaughter weight, and make decisions heavily dependent on pork prices.

Ag Conversions' innovations would influence the decision tree of all hog producers, as the conversion of waste into fertilizer provides the farmer with another asset. The potential for farrow-to-finish operations to hold back more hogs to continue producing waste does exist, but results positively in increased fertilizer production. Similar effects may present in feeder operations, and finishing operations may decide to produce more feeder hogs for increased waste. All choices will directly influence both the pork and fertilizer markets.

### **III. Purpose of the Business Plan**

Implications of this business plan exist in the business world, environmental movement, and general public. While the intention is to commercialize the sciences of Dr. Amiran, widespread adoption and use of the technology developed for has the potential to spark changes in multiple areas.

The first, most obvious, effect of this project is the creation of a new business and new jobs. The business will focus on hog waste removal from harms, a service which in itself may be sold for profit and drive the business forward. HEOF fertilizer adoption will increase competition in the fertilizer market, as this new revolutionary technology is introduced. Due to the fluctuations in fertilizer prices, as can be seen in the Farm Fertilizer Prices document (attached excel file), the introduction of a cheaper, organic fertilizer could bring about wider usage of organic fertilizer.

The second effect of this project is promotion of the environmental movement. The presence of hog waste is very undesirable, and there are farms which have such a problem that legal action has been taken (Oza, 2010). Removal of the smell will benefit the public of the surrounding area, and the production and use of organic fertilizer will increase the amount of organic farming performed, goals of many environmental groups, such as the International Federation of Organic Agriculture Movements (IFOAM, 2009).

The final and least obvious effect this project is recycling of the materials required to produce synthetic fertilizers, and reduced consumption of natural gas. Current production methods of synthetic fertilizers require large amounts of mining for raw materials, namely phosphate rock and potash, minerals which are limited in capacity. Nutrient recycling, as done with HEOF which contains essential elements for plant growth (John P. Chastain, 2003), is the only sustainable method for fertilizer production, and would potentially reduce the amount of mining, conserve natural resources, and reduce consumption of natural gas.

**IV. The Business Plan**

**Ag Conversions**

**South Dakota Implementation Business Plan**

A Subsidiary of Amiran Technologies LLC

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Legal Page

Confidentiality Agreement

The undersigned reader acknowledges that the information provided by \_\_\_\_\_ in this business plan is confidential; therefore, reader agrees not to disclose it without the express written permission of \_\_\_\_\_.

It is acknowledged by reader that information to be furnished in this business plan is in all respects confidential in nature, other than information which is in the public domain through other means and that any disclosure of use of same by reader may cause serious harm or damage to \_\_\_\_\_.

Upon request, the document is to be immediately returned to \_\_\_\_\_.

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Signature

\_\_\_\_\_

Name (typed or printed)

\_\_\_\_\_

Date

This is a business plan. It does not imply an offering of securities.



## **1.0 Executive Summary**

### ***Introduction***

Ag Conversions removes odiferous hog waste from farms and converts it into a High Efficiency Organic Fertilizer (HEOF) which does not replicate the detrimental effects of soil-depleting synthetic fertilizers currently marketed. The converted fertilizer is sold into co-ops, warehouses or gardening franchises, and redistributed to farmers for agricultural applications. The main goal of the company is to alleviate hog-waste related troubles occurring on typical farms, some of which may present with environmental impacts, community problems, or limits in available space. Illustrated in the following model is a Beta implementation for the state of South Dakota, where farmers, in exchange for odor-reducing chemicals, will be provided with Ag Conversions' services of free hog waste removal to a nearby facility that will convert the waste into fertilizers for resale.

The goal of Ag Conversions in South Dakota is to pave the way for future expansion of the company while establishing a 1% market penetration level and a breakeven point within the first fiscal year. To achieve these milestones, a timeline and a website, which along with careful marketing strategy and techniques will create product awareness, have been developed.

### ***Our Company***

Ag Conversions is committed to resolving odor problems present at traditional hog farms with the intention of eliminating cesspools and waste lagoons typically associated with pig farming. Our mission is to provide unique, ecologically sound and cost effective solutions for the decontamination of industrial and agricultural waste streams worldwide in a fashion which restores the environment to a pristine state while promoting beneficial reuse.

Ag Conversions venture will be spearheaded by Scott Berggren, a seasoned salesman with degrees in entrepreneurial studies and marketing from Babson College. A former President of Marshall Metals in Chicago and with over twenty-five years of experience in the industry, Scott undoubtedly will be a truly valuable asset.

Currently, Ag Conversions is a subsidiary of Amiran Technologies LLC located in Oak Creek, Wisconsin. Successful business ties have formed between Ag Conversions and various farms and governments throughout, including South Dakota and Poland. Further expansion to other states and countries is highly dependent upon a fruitful implementation in South Dakota. Presently, work is occurring at the hands of Dr. Mohsen Amiran, Scott Berggren, Phillip Skrade, and Sherwin Amiran. Ag Conversions aims to gain enough capital investments to launch the company within the next year.

***Our Products & Services***

Ag Conversions provides free hog waste removal services to South Dakota farmers via vacuum trucks in exchange for deodorizing agents. Each farmer will have the option of applying odor-limiting agents to untreated waste until removal occurs. In addition to waste removal, Ag Conversions offers industrial deodorizing agents of the 1103 line, and depending upon the nature of the odor and amount of waste, a proper chemical additive may be selected.

As the output of the conversion process, Ag Conversions will sell HEOG, organic fertilizers comparable in yield rates to synthetic fertilizers but which maintain and replenish natural soil health. Fertilizers can be crop-customized for provide appropriate NPK values.

***The Market***

As of now, South Dakota alone is home to 4.06 million hogs which produce roughly 4.5 kilograms of waste per day. With just 1% market penetration, this hones in on 40,620 hogs producing 402,000 pounds of waste per day. Despite a small market penetration, sufficiently large amounts are available for fertilizer conversion, resulting in substantial profits. Expansion to larger farms in the other five top producing hog states such as Iowa, North Carolina, Minnesota, Illinois and Indiana; offer additional options for implementation when the South Dakota model proves efficacious. Larger farms present the possibility of selling a conversion unit directly and converting waste on location, to be shipped, packaged, and sold at a later date.

Direct competitors of Ag Conversions are fertilizer companies offering synthetic options and who have established a strong customer base. To combat future threats, proper pricing strategy and a robust marketing campaign must be employed. The success and profitability of Ag Conversions relies on high fertilizer sales.

***Financial Success***

After the initial conversion plant is constructed and business relationships with several farmers have been formed, Ag Conversions can expect to begin to generate profits shortly thereafter.

Provided steady growth in the business, Ag Conversions will reach the break-even point in the fifth month of operation. Expected gross margins due to fertilizer sales are to be in the 66% - 79% range with net income per head in the 21% - 28% range. According to the financial model, there will be an expected twenty million dollar profit to be made. In the five year plan, there will be an expected one hundred fifty million in revenue. To maintain these levels of profit, there will be an essential series of expansions and several conversion facilities in the top five hog states will be constructed. Constantly adjusting the fertilizer prices to market response will play an integral part in the process as well. Adapting to the different needs and requests of farms from other areas will be a learning process that must be

addressed in order to maintain such levels of success and profit margins. The most critical key to realization is the efficient removal of odorous hog waste from *any* farm that desires it.

## 1.1 Objectives

The major objectives of this business plan are to:

1. Outline the proper procedures for implementation of Ag Conversion Units in South Dakota
2. Identify areas of the South Dakota plan which merit improvements and further thought
3. Demonstrate the potential for generation of large profits from the sale of manufactured fertilizers

## 1.2 Mission

Ag Conversion's mission is to provide waste management services to farmers of South Dakota, which encompass the removal of waste and application of odor eliminating chemicals, and to convert that waste into marketable, sellable fertilizers, customizable for specific crops. The commercial establishment of Dr. Mohsen Amiran's conversion units into odorless liquid and pelletized fertilizers will allow for experimentation regarding the potential of fertilizer augmentation with organic minerals, enhancing baseline levels of nitrogen, phosphorous, and potassium and resulting in High Efficiency Organic Fertilizer (HEOF).

## 1.3 Keys to Success

In order for Ag Conversions to achieve success, the following must be considered:

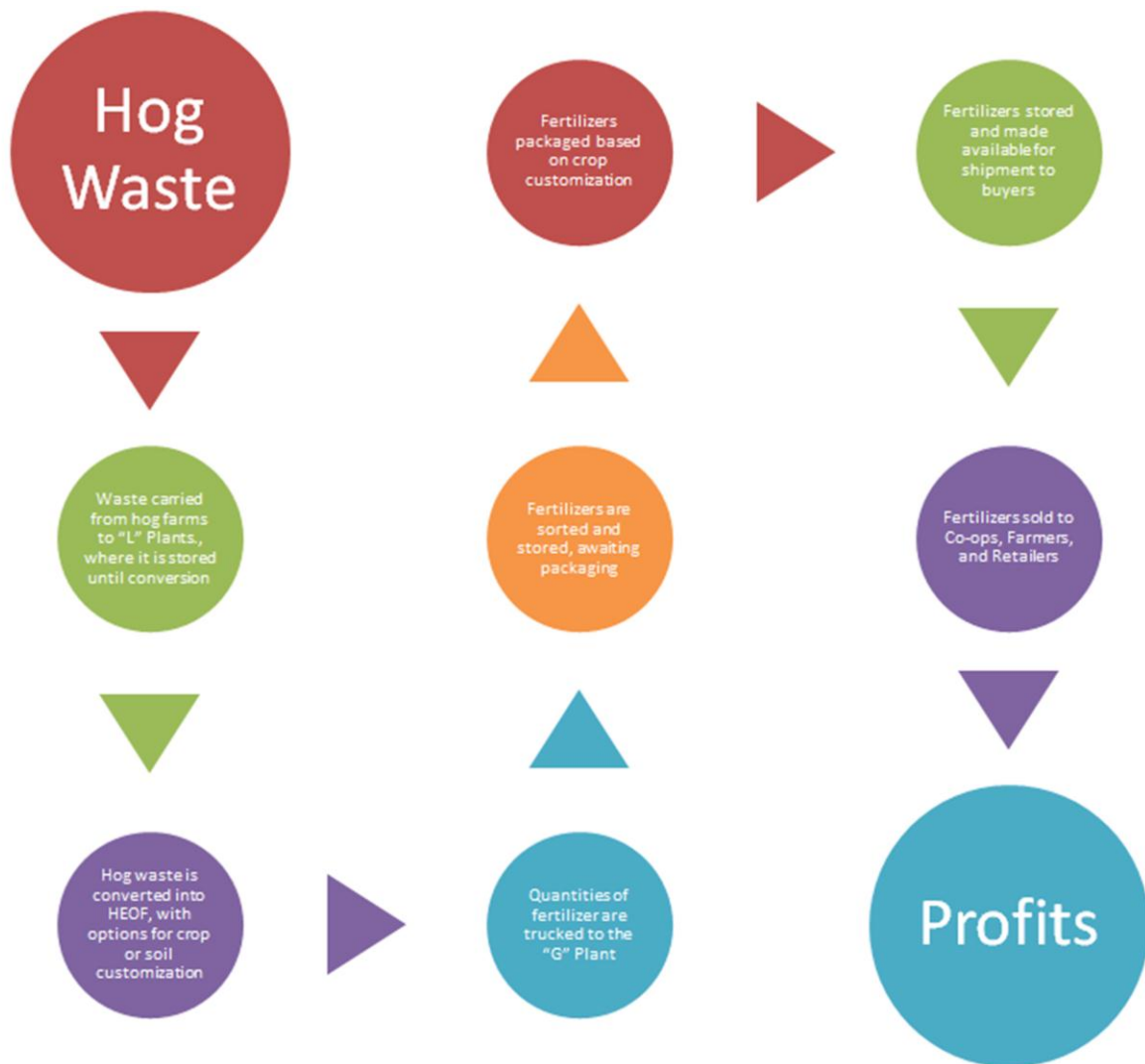
1. Cost of establishing the fertilizer conversion plants and central plant, including the construction of those facilities; employees for facility operation; and cost of fitting the conversion plants with Ag Conversion Units
2. Cost of establishing a trucking company or a contract with an existing company for the transport of waste and fertilizers
3. Marketing and selling the organic fertilizers, keeping in mind the current fertilizer market and publicly offered options

## 2.0 Company Summary

Ag Conversions has re-examined methods for hog waste disposal and developed a cost-effective procedure for converting pig waste on a continuous basis to liquid or pelletized High Efficiency Organic Fertilizer (HEOF). The Ag Conversions system can be scaled based on farm size and number of hogs, ranging from a single ton of hog waste to over hundreds of tons processed per hour. Odors associated

with pig waste, caused by the microbial decomposition of volatile compounds contained in manure, are limited or entirely eliminated through the addition of organically derived chemicals added to the conversion units.

By establishing a series of strategically placed fertilizer conversion plants and constructing a central fertilizer plant, Ag Conversions will be able to vastly alter traditional waste disposal methods in South Dakota. Hog waste will be trucked to each of these conversion plants, transformed into liquid or pelletized fertilizer, and then carried to the central plant where it will be packaged, stored, and sold. For the start of the company, there will be up to three “L” facilities chemicals that will handle the packaging on site as well. This will be accomplished as such until the venture becomes more successful and it becomes necessary to separate the creation and distribution of fertilizer to make the process more streamlined. Factory rental was another option that was explored, but deemed as less feasible as there may be problems with a dedicated storage facility that has all the necessary space and allowable expansions.



## 2.1 Company Ownership

Ag Conversions is a private corporation, wherein the marketing of conversion units, organically derived chemicals, and the waste to fertilizer conversion process occurs. Dr. Mohsen Amiran is the scientist and inventor behind the conversion units as well as the organically derived chemicals. A list of key individuals involved in this new branch of Ag Conversions as well as a description of respective qualifications and experience can be found below.

- **Mohsen Amiran, Ph.D, Founder, Chief Technical Partner**

He is the inventor of over 150 chemical formulations for cleaning the environment and has applied specialty chemicals to the photography, petroleum and weapons industries, and directed the development of six companies. A graduate of Essex University, Dr. Amiran holds a Doctorate in Physical Organic Chemistry, and has taught organic chemistry at Northwestern and Essex University.

- **Philip Skrade / Managing Partner, Amiran Technologies, LLC**

Mr. Skrade earned an MBA from the University of Chicago and, in Corporate Development roles for Fortune 500 companies, has completed acquisitions and joint ventures in North and South America, Europe, China, India and Japan. He has also held Controller, Treasury and Director of FP&A positions.

- **Scott L. Berggren / Managing Partner - Amiran Technologies, LLC**

Mr. Berggren graduated with a Bachelor of Science Degree in Entrepreneurial Studies and Marketing from Babson College in 1987. Mr. Berggren has worked for over 25 years in the steel, secondary aluminum industries around the world. He was President of Marshall Metals (Chicago) that built and operated two secondary aluminum smelters in Russia. He has also worked in the Czech Republic and Poland, purchasing various railway steel products from local steel mills for re-sale in Ecuador and India. He also traded various industrial and consumer commodities, and was responsible for Supply Chain Management for these commodities in Eastern Europe, the Middle East, Mexico and China.

## 2.2 Start-Up Summary

Start-up expenses include:

- Construction of facilities, from the purchase of land to breaking ground to a fully operating plant
- Furnishing each facility with the appropriate equipment
  - "L" Plants require a conversion unit and possible storage for waste to be processed, as well as storage for a one month's advance supply of chemicals and fertilizers awaiting transportation
  - If success allows for construction, "G" Plants require storage for incoming and packaged fertilizers, as well as areas for packaging and shipping
- Cost of establishing an appropriate work-force with well-trained employees

Assets include:

- BioGenesis chemicals applied for odor-elimination and waste-to-fertilizer processing
- Conversion Units

Financing for expenses and initial assets will be derived from investors and venture capitalists, in addition to borrowing money in the form of bank-approved loans.

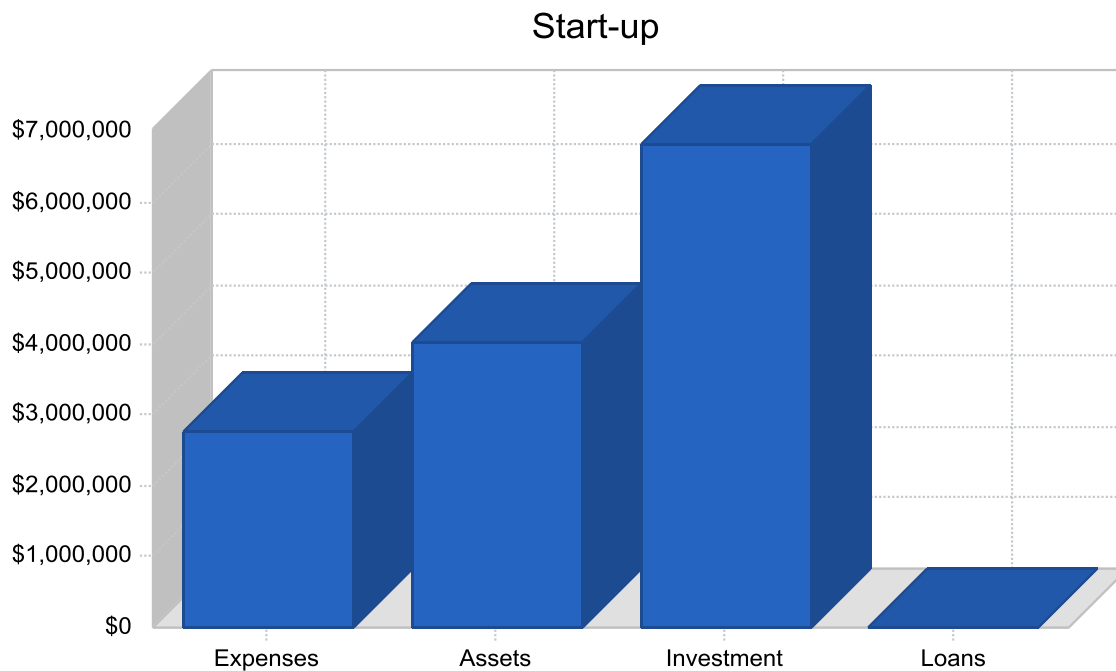
Values for land were estimated based off of comparables. Values for legal fees were based off of the estimated number of patents needed, as well as trademarking, and man hours to accomplish these legalities. In order to estimate the cost of constructing the facilities and materials, research and quotes were obtained through <http://www.buildingsguide.com/factory-buildings.htm>. Chemical costs were estimated based on HEOF Assumptions, shown in the Appendix. Potential employee

training wages were based off of the assumption of a two week training period of ten business days, eight hours per day, at thirty dollars per hour for at most fifty employees. The start-up values are rough estimates.

Table: Start-Up

<i>Start-up</i>	
Requirements	
Start-up Expenses	
Legal	\$75,000
Insurance	\$200,000
Land for One L and G Facility	\$125,000
Construction of Facilities	\$100,000
Materials	\$1,000,000
Utilities	\$2,500
Computers, Phones, & Electronics	\$20,000
Conversion Units	\$135,000
Chemicals	\$180,000
Packaging Process	\$200,000
Trucking & Shipments	\$470,000
Employee Training Wages	\$120,000
Other	\$150,000
Total Start-up Expenses	\$2,777,500
Start-up Assets	
Cash Required	\$3,000,000
Start-up Inventory	\$180,000
Other Current Assets	\$100,000
Long-term Assets	\$750,000
Total Assets	\$4,030,000
<b>Total Requirements</b>	<b>\$6,807,500</b>

Chart: Start-Up



### 3.0 Products & Services

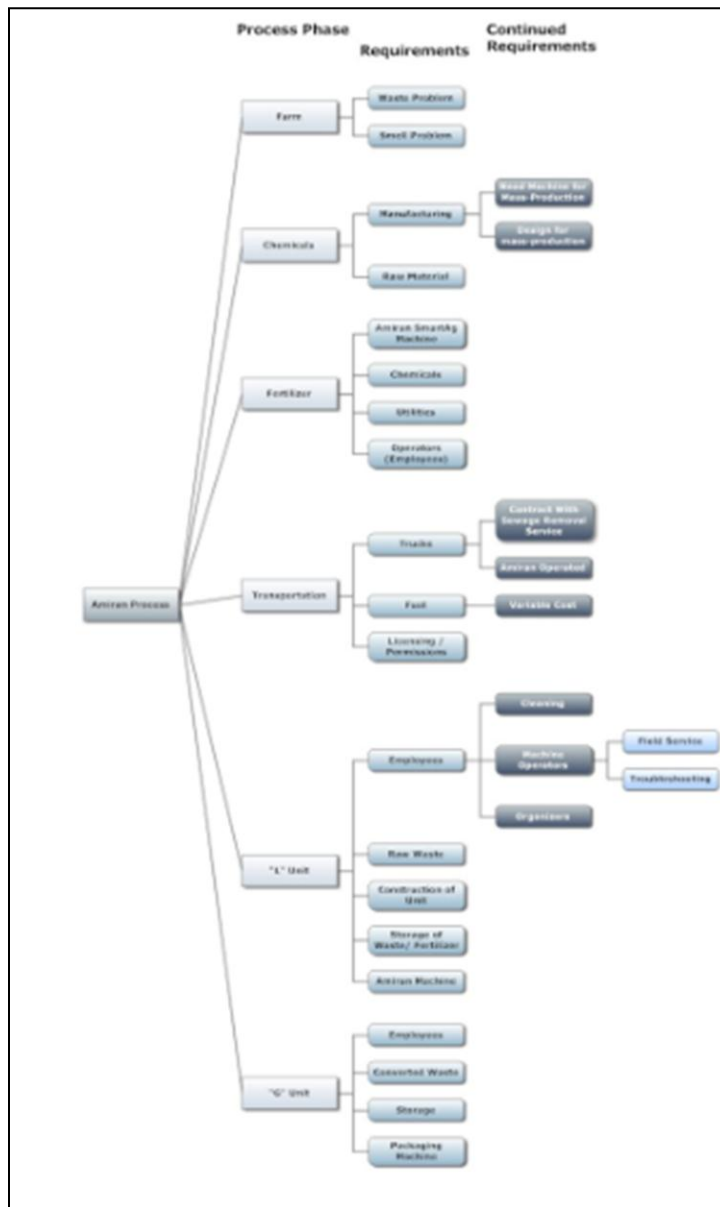
Ag Conversions has a patent-pending process which, when used with our proprietary chemicals and soil supplements, converts swine waste to High Efficiency Organic Fertilizer (HEOF) in a liquid or granulated form. Ag Conversions offers to South Dakota farmers an opportunity to eliminate hog waste from their properties, thereby eliminating associated pungent odors.

With this waste, Ag Conversions will be able to produce odorless liquid or granulated fertilizers, which can be custom blended to meet virtually any crop or soil-specific need. This HEOF helps reverse the degradation of soil caused by applications of synthetic fertilizers, and also serves to improve soil fertility by reintroducing organic material and other trace minerals. It will be marketed and sold to farmers, co-ops, and in the future after some brand name has been made, potentially chain consumers such as Lowe's, The Home Depot, and Ace Hardware, and will generate substantial profits. The process is scalable to meet virtually any input or output demand.

Fertilizer conversion plants will be constructed at locations strategically chosen based on the input of hog waste and number of surrounding farms. At these locations, hog waste, which will have been trucked from farms to the plants, will be processed through the Ag Conversion units to produce fertilizers. Post production, these fertilizers will be trucked to a centrally located facility to be packaged, stored, and sold.



When considering the marketing and sale of HEOF, Ag Conversions must evaluate several options. A key aspect of the business will be the ability to remove or convert waste from any interested farm, and rejecting farms will undoubtedly result in loss of profits in addition to an unreliable reputation for Ag Conversions. The ability to handle the needs of all farms will build trust, support, and customer loyalty amongst the farming community and existing customers. In order to determine an optimal method for dealing with all levels of interest, Ag Conversions must decide which elements of the company they will manage and which will be outsourced. If Ag Conversions assumes control for too many areas of responsibility during the initial implementation of the system, the company may encounter serious financial losses.



### 3.1 Market Analysis Summary

The overall market for Ag Conversions is immense, ranging from small hogs farms to large scale operations across a variety of states. In order to determine the viability of Ag Conversions, initially South Dakota farmers will be targeted. In this setting, Ag Conversions will be able to establish a commercially successful business and generate high revenues, the majority of which will result from the sale of resulting manufactured High Efficiency Organic Fertilizers.

Based upon the impending success of Ag Conversions in South Dakota, enormous opportunities for growth and expansion exist. Due to the flexibility of the conversion units to be scaled to a farm appropriate size, it is reasonable to envision Ag Conversion Units as regular machine establishments on a widespread and massive number of hog farms, stretching across the major hog farming states.

### 4.0 Market Segmentation

Ag Conversions provides the same service to a number of different farms. Removing odiferous hog waste and selling it as fertilizer is the bare-bones objective of the company. These two categories can be segmented into smaller units as seen in the list below.

#### Hog Waste Removal

- Small Farm (Assumes a Farm with 3,000 Hogs or less)
- Larger Farm (Assumes a Farm with 10,000 Hogs or more)

#### Fertilizer Sales

- Wholesale
- CO-OP
- Farmer Direct
- Department/Construction Store

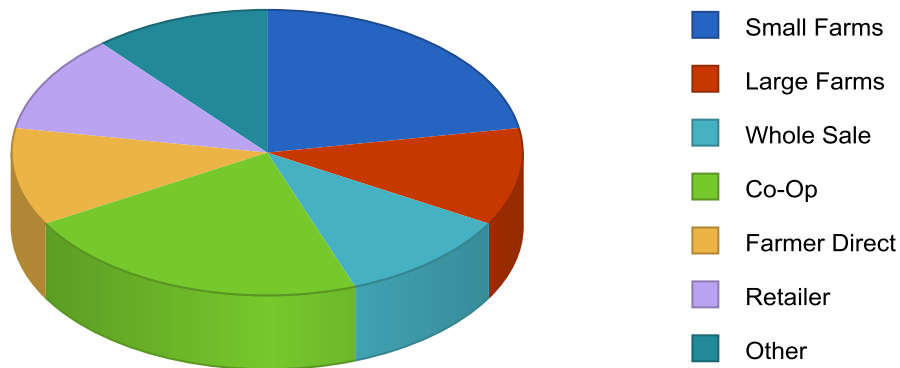
Table: Market Analysis

Market Analysis	Potential Customers	Growth	Year 1	Year 2	Year 3	Year 4	Year 5	CAGR
	Small Farms	5%	20	21	22	23	24	4.66%
	Small Farms	10%	20	22	24	26	29	9.73%
	Small Farms	15%	20	23	26	30	35	15.02%
	Large Farms	5%	10	11	12	13	14	8.78%
	Inserted Row	10%	10	11	12	13	14	8.78%
	Large Farms	15%	10	12	14	16	18	15.83%
	Whole Sale	5%	10	11	12	13	14	8.78%
	Whole Sale	10%	10	11	12	13	14	8.78%

Whole Sale	15%	10	12	14	16	18	15.83%
Co-Op	5%	20	21	22	23	24	4.66%
Co-Op	10%	20	22	24	26	29	9.73%
Co-Op	15%	20	23	26	30	35	15.02%
Farmer Direct	5%	10	11	12	13	14	8.78%
Farmer Direct	10%	10	11	12	13	14	8.78%
Farmer Direct	15%	10	12	14	16	18	15.83%
Retailer	5%	10	11	12	13	14	8.78%
Retailer	10%	10	11	12	13	14	8.78%
Retailer	15%	10	12	14	16	18	15.83%
Other	5%	10	11	12	13	14	8.78%
Other	10%	10	11	12	13	14	8.78%
Other	15%	10	12	14	16	18	15.83%

Chart:

Market Analysis (Pie)



#### 4.1 Target Market Segment Strategy

Ag Conversions will target both small and large farms in the state of South Dakota, and expansion into other areas will depend on initial success. Because the state will provide initial funding as well as government support in exchange for jobs, there is a greater chance of true implementation occurring. In integrating the structure of waste removal to a central conversion facility, Ag Conversions will be able to provide the added benefit of not having waste storage on farmer land. For much larger farms, deals may be made to set up a conversion unit on the land such that the farmer is completely self-sustainable

in creating his or her own fertilizer. By catering for the needs of both small and large farms, Ag Conversions is able to gain a greater audience as well as produce more fertilizer for resale.

Ag Conversions cannot wait for customers to seek out their services, but must instead employ an aggressive marketing campaign to recruit customers and build a customer base. Initially, we must focus on farms in South Dakota whose needs will match the offerings of the company, specifically smaller farms with waste amounts Ag Conversions can manage and successfully convert into HEOF. After building a small farm customer base, Ag Conversions will begin to recruit customers of larger farms, and therefore, larger amounts of waste. A gradual build from smaller to larger farms will allow the company to work out unexpected issues regarding conversion units, the trucking of waste and resulting fertilizers, and to establish marketing relationships with co-ops, farmers, and retailers, relationships which are key to the expansion of Ag Conversions and the generation of profits. In the South Dakota model, if the state is willing, it will become the socializing element that provides their services in the marketing field. If the company were to spread out of state, help from other states in the field of socializing and marketing will be a great resource if it can be attained.

## **4.2 Service Business Analysis**

Currently, hog waste is disposed over long periods of time with large, pungent lagoons. Ag Conversions offers a solution to this odor-overwhelming problem through the marketing and construction of the units and application of organically derived chemicals. Waste will be converted into odorless liquid or granulated fertilizers, customized with minerals, and resulting in a final product of High Efficiency Organic Fertilizers.

There is no other company currently offering neither hog-waste removal services, nor a machine in existence capable of converting hog waste into usable fertilizers. Due to this void in the market and their innovative, never-done-before machine, chemicals, and process, Ag Conversions will be able to create a new sector of the farming and fertilizer markets.

## **4.3 Competition & Buying Patterns**

This is a compilation of basic research on fertilizers in general, as well as the specific benefits and concerns regarding both inorganically and organically produced fertilizers, and how these problems might be remedied by the introduction and adoption of Amiran Technologies' High-Efficiency Organic Fertilizer (HEOF). Outlined are specific advantages and disadvantages of both synthetic and organic fertilizers, and how Amiran HEOF solves the problems of these fertilizers while maintaining similar advantages.

### ***Considerations***

- Produced organically and inorganically around the world
  - Dow Fertilizer - Inorganic
  - Monsanto Corporation – Inorganic

- Fertrell Company - Organic
- Culterra Organics – Organic
- Contains important elements (Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulfur), as well as trace elements (Boron, Chlorine, Copper, Iron, Manganese, Molybdenum, Zinc).
- N-P-K labeling to give percentages of elements by weight. N stands for Nitrogen, P represents P<sub>2</sub>O<sub>5</sub> (not elemental Phosphorus), and K indicates K<sub>2</sub>O (not elemental Potassium). Elemental phosphorus content is .463 times the 'P' value, and elemental potassium is .83 times the 'K' value.
  - A 10-10-10 fertilizer would contain 10% Nitrogen, 4.63% Phosphorus, and 8.3% Potassium by mass.
- Improper application of fertilizers can lead to environmental pollution.

### ***Inorganic Fertilizers***

- Developed during the Industrial Revolution, widely used during the British Agricultural Revolution and the Green Revolution during the mid-20<sup>th</sup> century.
- Supported massive population growth worldwide.
- Production requires mining phosphate rock, potassium, and the use of fossil fuels
- **Advantages**
  - Can be produced quickly and in large quantities.
  - Highly specialized, can alter the content of any mineral.
- **Disadvantages**
  - Many do not replace trace elements which are gradually depleted by crops.
  - High energy cost to produce.
  - Requires non-renewable resources to produce, unsustainable in the long-term.
  - Price fluctuates with the price of fossil fuels and mined minerals.
  - Over-application causes fertilizer burn, as well as damaging the land (India).

### ***Organic Fertilizers***

- Come in multiple forms
  - Manure, Compost, Seaweed, Guano, various mineral deposits.
- Used widely for many centuries.
  - Asia returned human waste to soil to maintain soil fertility.
- **Advantages**
  - Improves the biodiversity of the soil and rejuvenates the soil over time.
  - Low energy cost to produce.
  - Sustainable in the long term.
- **Disadvantages**
  - Takes longer to produce, manure must sit for 120 days before it becomes viable.
  - Concerns about bacteria and other pathogens if manure is not composted properly.

- Variable nutrient content depends on the composition of the fertilizer.
- Take up more space.
- Expensive to produce

### ***Amiran HEOF***

- We hope to be able to produce organic fertilizer at the price of (or cheaper than) synthetic fertilizers.
- The processing of hog waste, using “green” chemicals, to rid the material of pathogens and odor-producing chemicals, and to turn it into either liquid or powdered HEOF.
- **Compared to synthetic fertilizers:**
  - Price is more stable, as production uses no fossil fuels or mining.
  - Sustainable to produce.
  - Rejuvenates the soil, cannot cause fertilizer burn. Over-fertilization is less harmful.
  - Similar and/or lower pricing.
  - Lower energy cost to produce.
- **Compared to organic fertilizers:**
  - Lower overall cost to produce.
  - Processing destroys harmful pathogens in the manure.
  - More consistent nutrient content due to pigs’ diets being controlled by farmers.
  - Can be specialized by adding additives during the processing.
  - Takes up less space due to powdered form.
  - Takes less time to produce.

### ***By Cost of Materials***

Fertilizer prices are primarily dependent on the cost of the materials that are required to make them. These materials are **phosphate rock**, **potash**, and **natural gas**, which are used to generate the different component minerals of fertilizer (phosphorus, potassium, and nitrogen, respectively). According to the USGS, the price of phosphate rock by the end of the third quarter of 2010 was \$150 per ton, and the price of potash was \$600 per ton, though the price of potash fluctuated wildly between 2006 and 2010, reaching as low as \$375 per ton in 2006 and peaking at \$835 per ton in 2009. The US Energy Information Administration reported the price of natural gas at \$5.07 per thousand cubic feet, with a 3-month YTD of \$5.40 per thousand cubic feet.

### ***By Distribution***

The International Fertilizer Industry Association estimates that 50% of the total cost of marketing and distributing is made up of transport costs alone. Other costs that influence the price of fertilizer are handling, overhead charges, administration charges, promotion activities, and trade margins. The IFIA also estimates that these costs represent 20% of the price paid by farmers for fertilizer in Western Europe. In the Philippines, the total marketing cost of \$73 is 31% of the retail price of \$234 worth of fertilizer. Of these marketing costs, the margins (i.e. mark-up) are around \$10 to \$12 per ton of fertilizer.

### ***Current Prices***

Fertilizer prices vary depending on the type of fertilizer. Here are some from the USDA, in dollars per ton:

- Anhydrous ammonia: \$749
- 30% nitrogen solutions: \$351
- Urea 44-46% nitrogen \$526
- Ammonium Nitrate \$479
- Sulfate of ammonium \$423
- Super phosphate 44-46% phosphate: \$633
- Diammonium phosphate: \$703
- Potassium chloride 60% potassium: \$601

## **5.0 Web Plan Summary**

Ag Conversions will have an online site dedicated to informing potential customers as well as users of the benefits of our conversion units, fertilizers, and our solution to odor problems associated with hog waste. Its main goal will be to inform of the beneficial effects of organic fertilizers as well as explain how the NPK values are different from those of traditional synthetic fertilizers. By informing the community of services offered by Ag Conversions, customers can be gleaned from farmers who must deal with waste according to local legislation and from farmers who are independently interested. If correctly implemented, the site may be an excellent marketing and sales opportunity, though not to larger companies such as Lowes or Home Depot. Depending on how much time or effort will be invested, the site could have separate sections that the customer can enter depending on who he or she is i.e. For investors, distributors or CO-OPs.

### **5.1 Website Marketing Strategy**

The website will have a page where customers may log in and order the chemical additives or even request to see a demo unit that they may want to install in their community or farm. There will be a list of locations where Ag Conversions will be attending fairs to showcase and sell units individually. Also, requests can be made to set up a collection facility near a customer's farm. Making the buying process as easy as that of major internet sites will be a plus and allow for large shipments of fertilizer or chemicals to any location within the Ag Conversions' areas. After gains some brand recognition, it may have a page for large companies.

### **5.2 Development Requirements**

To set up and manage the database, server, and website, Ag Conversions will seek an additional employee. Finding a server that will handle the internet traffic will be up to the hired person. It is a hope

that this website will be up within three months and be able to answer the needs of its customers. A link to the site will be available on Ag Conversions' parent company website. Proper maintenance of the site as well as weekly updates will be important, and a customer service hotline will be necessary to assist in the internet sales department.

## **6.0 Strategy & Implementation Summary**

The primary focus for Ag Conversions' marketing strategy must be to establish working relationships with farmers and buyers early on. Without these relationships waste input will drop, fertilizer production will drop, and substantial financial losses will occur. Ag Conversions must gain acceptance with farmers, and entry into co-ops and retailers in order to found a solid customer base and begin growing.

### **6.1 SWOT Analysis**

The technology developed by Ag Conversions is revolutionary, and therefore will change the dynamic of the marketplace significantly. This new technology operates quickly, is easy to use, and can be expanded to fit multiple sections of the market.

While Ag Conversions has a large list of weaknesses, the substantial market size and existing interest imply a definite level of success. Proper response measures to current leaders in the fertilizer markets and timely operations management of Ag Conversions are keys to a profitable business. Ag Conversions has the potential to be a very successful business, as well as a popular one within many notable groups, including environmental groups and agricultural co-ops. However, there are also many businesses which will be affected by the introduction and adoption of the technology, and there will be responses from these companies which demand countermeasures and protection to ensure both stability and success.

The size of the market lays down a vast frontier for the expansion of Ag Conversions; it also sets up a difficult scenario for market entry. The market for fertilizers is so well established, and has existed for a number of years, that adoption of Ag Conversions' technology may be slow. In addition, the sheer size of the market correlates to a massive amount of raw material being produced for Ag Conversions fertilizer. The amount of fertilizer produced may also be problematic, as the nature of agriculture is such that fertilizer is bought in large quantities only three times per year.

There are also many unique opportunities for Ag Conversions' technology. Its environmentally friendly nature lends itself to support from the environmental movement. As the technology is new, it will be easy to patent, as it can be classified as "original". The protection of the process and chemicals involved will help to protect the business as it grows.

The nature of Ag Conversions poses threats to existing fertilizer developers and mining companies. The entry of Ag Conversions to the market will disrupt the mining and synthetic fertilizer production



business, and will surely generate a response. These responses will have to be thought of and protected against ahead of time in order to secure a foothold in the market.

### 6.1.1 Strengths

1. **Fast and Reliable Conversion.** Depending on the size of the units, each can convert up to seventy-five tons of solid waste into fertilizer per day.
2. **Unit is Simple to Use.** The conversion unit can be configured in a fully automated process that requires the push of a button to operate as well as adding the organic chemicals every few hours.
3. **Strong Potential for Expansion.** Every unit is configured such that it can output fertilizer for a specific crop just by changing the additive formula.
4. **Large Market.** Currently in the United States alone there are roughly 67.8 million hogs at any given time. This amounts to a substantial amount of *untreated* waste which has the potential of releasing nauseating fumes. Other large producers of pig waste are Europe and China.
5. **Effects on Soil.** The effects of Ag Conversions fertilizer on the soil is different from synthetic ones in that it does not deplete the soil of necessary compounds but instead supports crop growth by replenishing the soil with minerals and nutrients.
6. **Current Fertilizer Market Prices.** Several conventional synthetic fertilizers are petroleum based which directly results in rising market prices. Due to the widespread use of petroleum and it's rising prices, fertilizer process will also continue to rise. The introduction of organic fertilizer which replenishes the soil and is competitively priced will be welcomed.
7. **Environmentally Friendly (i.e. "Green").** This new technology will offer an alternative to synthetic fertilizers, and may be supported by both eco-friendly movements and environmentally conscious political activists.

### 6.1.2 Weaknesses

1. **Large Output Capability.** The Ag Conversion process handles extremely large amounts of waste on a daily basis, but is largely dependent on how much material is brought to the facility. Selling this waste may present a problem of high supply and limited demand as fertilizer is bought in large amounts only three times per year.
2. **Amount of Raw Material.** Dealing with the sheer amount of waste may become an issue for transportation and pre-processed storage. Managing the large scale pick-up and removal presents potential for error.
3. **Farmer Acceptance.** Many small-scale farms are able to rid waste per natural methods and long term storage which allow for composting and decomposition of pathogens. Some may see the conversion process as another waste of time or resources.
4. **Credibility.** The Ag Conversion Units have seen limited acceptance and actual market use. Building a reputation and brand will require time and capital.
5. **Local Laws and Legislation.** Ag Conversions must consider restrictions on use of pig waste-derived fertilizer as well as what defines animal waste. It must be researched how long "animal waste fertilizer" must be let sit in the ground for safety issues.

### 6.1.3 Opportunities

1. **Expansion to Other Wastes.** The Ag Conversion Units can potentially operate under the same conditions and be adapted to handle other wastes such as Turkey, Chicken, etc... Per a small change in the organic chemistry of the additives.
2. **Patented Technologies.** The Ag Conversion Unit, chemicals, and process will be patented and protected in terms of intellectual property. This will hinder replication of the process and protect trade secrets.
3. **Website.** The website can be used as a sales and marketing tool if properly advertised and implemented. It will be easy to access and allow Ag Conversions to reach potential customers otherwise not considered.

### 6.1.4 Threats

1. **Fertilizer Companies.** Producers of fertilizers will be against Ag Conversions and attempt to undermine or downplay acceptance of the product. A response in addition to counter measures must be considered before fertilizer market penetration occurs.
2. **Mining Companies.** There is a tremendous amount of money to be made from companies that mine the raw materials such as phosphate rock and potassium oxides. By recycling the existing nutrients in hog waste, Ag Conversions will be decreasing the business of these mining companies. Responses from the industry must be considered and either worked around or protected against.
3. **Farmers.** Acceptance of the fertilizer and service of waste removal will be difficult to achieve. By making use of free waste removal in return for chemicals, Ag Conversions will be able to overcome this hurdle. To gain the widespread use of the fertilizers, competitive pricing strategy as well as marketing must be used.

## 6.2 Competitive Edge

- Ag Conversions' fertilizer is organic. Competitors sell synthetic soil/nutrient depleting chemicals which are overused to the point that it is no longer sustainable.
- Ag Conversions' fertilizer can be produced as quickly and as cheaply as synthetic fertilizer. With prices of synthetic fertilizer on the rise, our product will become more popular.
- Ag Conversions has funding from various sources such as the state of South Dakota and therefore does not need to bootstrap the entire operation. As an offshoot from Bio-Genesis, the company is not entirely new.
- Headed by experienced sales and management, Ag Conversions does not need to go through the "learning phase" that traditional novices to business may experience.
- Ag Conversions has an experienced team of engineers and chemists that are able to come up with new technologies to fight waste odor and other associated problems.

## 6.3 Marketing Strategy

1. **State and Local Governments.** Getting funding for the proposed project will be a crucial first step towards market **penetration**. South Dakota may be a source of income for this purpose.
2. **Environmental Movement.** Ag Conversions technology is revolutionary. The eco-friendly nature of the technology provides possible support and verification of the technology. Having non-profit backers of the company will be an asset towards market **entry**.
3. **Wealthy Farmers.** The technology developed by Ag Conversions is not easily affordable by the average farmer. Getting wealthy farmers on board with the technology will help with the **adoption** of the technology, and may give local governments and co-ops incentives to create monetary grants.
4. **Small Farmers.** Collecting waste from small farms will be an easy decision on the farmers' part. In exchange for free waste removal, the farmer may receive odor reducing chemicals. This effectively takes away the task of dealing with excess waste for the farmer resulting in more time working in the field.

## 6.4 Sales Strategy

Ag Conversions will be able to successfully market the conversion units and chemicals to farms which have a known problem of dealing with hog waste. To further facilitate a contract, Ag Conversions will need to decide if they will offer discounted or free chemicals, depending on terms of a lease or contract. For smaller scale and potentially larger farms there is an option for a waste removal plan which includes a daily or weekly transport as determined by agreements made with farmers. Use of this attractive odor reducing formula and waste removal will result in the added benefit of farms having more space that they can effectively use for crop growth. Growing the customer basis from there will require a strategically thought out marketing campaign that educates potential customers while pushing the products, in addition to a word of mouth spread of information. A key tool in expanding the customer base is the website, which includes informational pages as well as ordering options and the states' socializing abilities. Essential for success is pricing strategy. HEOF must be sold at competitive pricing while still acting comparably to traditional fertilizers.

Before Ag Conversions can begin to operate conversion plants in South Dakota and sell fertilizers, two goals must be achieved:

1. Farms must be contacted and relationships established so that waste is available for fertilizer conversion as soon as all facilities are up and running
2. Marketing relationships with co-ops, farmers, and retailers must be established so that resulting fertilizers can be sold and profits generated as soon as the first batch of fertilizer is produced

Key points for sales include:

- Sales will be done through Farm Bureaus or Ag Co-ops, as it will be difficult to go from farm to farm selling fertilizer. We will continue to market our fertilizer to both farmers and the public for home use, but we are hoping for word-of-mouth, grassroots-style spread of awareness of our fertilizer from farmer to farmer, either directly or through Co-ops.
- Sales will spike during the growing season, so sales people will be compensated higher during the growing season, as there will be many more potential orders. They will receive their standard wage during the non-growing seasons. To offset this spiked pattern, selling fertilizer out of state is an option worth exploring.
- Ag Conversions will either contract with a trucking company to deliver fertilizer from storage to the farmer, or will handle its own specialized trucks. Delivery will have to be efficient to minimize delays. Plans should be made for when a larger demand for trucks occurs, how long will delivery be sustainable with the initial amount of trucks at hand?
- Price of Ag Conversions' HEOF will be set higher than the price of synthetics, with a premium for being "organic". On the five-year financial chart (ATTACHED AS SALES FORECAST), there is a slot to insert the price of fertilizer, and it will automatically adjust it with a premium.

#### **6.4.1 Sales Forecast**

We are expecting an accelerating growth as time passes. By 'accelerating', we mean the volume of sales of HEOF for any given growing season increases, not on a per month basis. However, there will likely be smaller sales throughout the months as HEOF hits retail shelves and in cases of a farmer not purchasing enough. Delivery delays must also be factored in.

We project sales to be low in the first month without much advertising prior to the start of the growing season, but to increase as awareness and reputation develop. The estimation in the 5-year financial model is conservative, and sales are done on a by-the-ton basis, so sales of 300 would be 300 tons sold.

We are assuming that sales only occur in large numbers every four months, due to the seasonality of growing crops. In addition, we are assuming that we manage to maintain a market portion sufficient to generate these sales (i.e. we aren't driven out by other fertilizer producers). We are assuming that the higher prices we charge for our fertilizer (i.e. the 10% premium for organic) will avoid attracting negative attention from synthetic producers who don't want competition.

Our sales forecast is accurate, as we will have low sales in the first month due to a low market penetration. However, the results of our fertilizer application will become apparent before the start of the next growing season, resulting in word-of-mouth spread of awareness, as well as development of Ag Conversions' reputation.

#### **6.5 Milestones**

The provided Gantt Chart (ATTACHED AS GANTT CHART) shows a list of various tasks that are to be completed in the near future. Some topics that need to be addressed are: setting up a demo farm:

planning the conversion facilities and building them; and conducting market research for fertilizers. Other topics that will need work are setting up a strategy and partners for selling fertilizer as well as response to changing situations both in the market as well as the farming community. Actual dates and time frames still need to be addressed with a most realistic sense, i.e. 1% market penetration will require more than just one year and construction will take an extended amount of time due to permits and land acquisition. One particular piece worth noting is the construction of a temporary “L” plant. This will be constructed before the actual facility to begin making a positive cash flow and provide a chance for Ag Conversions to figure out what will be necessary for the actual facility to be run most efficiently. It should also be noted that this temporary plant will be *temporary* and a permanent facility will need to replace it as soon as possible, preferably within six months of the completion of the first plant.

## 7.0 Management Summary

This section describes the personnel needed to get the company off the ground, as well as the future personnel that will be needed as Ag Conversions expands.

**Vision:** For the company to even get off the ground, the company needs a **concrete** vision that will guide the growth and development of Ag Conversions. This vision will be the core of all the decisions the company makes.

### *As A Start-Up*

1. **Management.** The company will need a **Chief Executive Officer** to handle decision making and a **Chief Financial Officer** to handle the financials of the company. These will be founders of the company. The CEO will handle the **legal** portion of the company as well as **IP** (i.e. patents and trade secrets) and **HR**. The CFO will work closely with **marketing** and **sales** and play a major role in both as the company gets going, and will handle **risk, strategy, and investments**.
2. **Marketing.** The company will need a marketing official, who will become the **Chief Marketing Officer** as more marketing personnel are hired. This person will also be a founder. Marketing will also handle **content, communications, and website development**.
3. **Sales.** The company will need sales personnel to interact with clients such as South Dakota, one of which will be a **Chief Sales Officer**. The CSO will also be a company founder. Sales will also handle **learning, technical, and networking**.
4. **Information.** Dr. Mohsen Amiran, a company founder, will be on staff to facilitate the necessary flow of technical information, and will oversee **development of new technologies**, eventually forming a technical division within the company.

As the company grows, the portions highlighted in black above will have divisions created and possibly officers assigned to them.

1. **HR and Legal.** An officer will be hired to handle Intellectual Property Rights, and one to deal with contracts and as a presence in Washington D.C., designated **Chief Intellectual Property Officer** and **Chief Legal Officer**, respectively. Whether a whole team is needed is unclear, but an Ag Conversions officer will be needed to advise the company as the minimum. Possibly also hired may be an information security officer, designated **Chief Information Security Officer**.

There will have to be a human resources division created, with the head designated **Chief Human Resources Officer**.

2. **Investing.** An officer to handle the investments of, the **Chief Investment Officer** may be assigned.
3. **Advertising.** A division to deal with content generation, broadcasting, and website development will be created to inform the public on' technology. An officer will be needed to head this division, designated **Chief Content Officer**. As the web presence grows, a **Chief Web Officer** may be hired to head the website.
4. **Strategy.** A division to plan strategies to ensure the competitiveness of must be created, headed by the **Chief Strategy Officer**.
5. **Communications.** An officer to handle the communications to employees, shareholders, media, the community, etc. will be assigned, the **Chief Communications Officer**.
6. **Networking.** An officer to facilitate information flow, profit growth, and the creation and maintenance of communities will be assigned, the **Chief Networking Officer**.
7. **Learning.** A division of the company to handle training of new employees will be created, headed by the **Chief Learning Officer**.
8. **R & D.** A division of the company to develop new technologies and facilitate innovation of new products will be created to ensure the growth of. This division will be headed by an officer responsible for the commercialization of new technologies, designated the **Chief Technical Officer**. Under the CTO will be two officers to handle the development, the **Chief Engineering Officer** to handle product development, and the **Chief Science Officer**. The CSO will most likely be Dr. Mohsen Amiran, a founder of the company.

### *Specific to South Dakota*

9. **Trucking.** The hog waste needs to get from the farm to the 'L' conversion units. To do this, Ag Conversions will either create its own trucking company, or will contract with a septic company which has the necessary vacuum trucks. Should it create its own trucking division, there will be drivers required for each truck, possibly two to a truck to increase the speed of the process. Were Ag Conversions to contract with a septic company, no personnel would be needed to drive trucks. In addition, there will be fertilizer needed to be trucked from the 'L' plants to the mother 'G' plant, so there is another opportunity to either create a trucking division of Ag Conversions or to contract out to truck companies. As stated before, until the start-up becomes more successful, the "L" and "G" plants will combined into one facility.
10. **Conversion.** Once the 'L' and 'G' conversion plants or combined plant are complete, there will be staff required for both types of facilities to operate. Due to the hazardous nature of the material being worked with at the 'L' plants (the hog waste, most notably), it is advisable to automate some parts of the process. There will be employees required at the 'L' plant to load the end result of the conversion process (the HEOF), into the trucks to take it to the 'G' plant. There may also be workers to take the waste from vacuum trucks at the plant and load it into the conversion units, or this process may be automated. At the 'G' plant there will be workers required to load the HEOF into the processor, and workers to handle the packaged HEOF at the end of the process.

## 7.1 Personnel Plan

1. **Costs.** The salaries will most likely be trivial for a startup company, and will be standardized as the company grows. Standard salaries will be created for the various positions within divisions of the company as they are created.
2. **Personnel.** Few personnel at startup, everyone handles bits and pieces of everything, but there are specifics that individuals will handle. Information is shared as needed to ensure the successful start of the company.
  - The *average* employee will make an hourly wage of thirty dollars with potential for raises in pay. Employees may also be offered benefits packages.

## 8.0 Financial Plan

The function and success of Ag Conversions depends greatly upon financial logistics. In order to roughly estimate and forecast the start-up as well as required funding for the business, several parameters were estimated and predetermined. Several of these options are described in the sections following below (ATTACHED HEOF INCOME EXCEL FILE).

The *assumptions* page lists several of the expenses that are associated with fixed costs that together go under the category of “cash burn rate”. This is a combination of one-time fixed costs as well as concurrent costs such as construction for the buildings and chemical prices, respectively. Included in the assumptions page is the cost of employees and “L” and “G” plant construction as well as operating costs. This particular document uses South Dakota as the test site with a market size of roughly 4 million hogs. The document can be edited and values changed to reflect other parameters such as different states or market penetration.

The *High Efficiency Organic Fertilizer (HEOF) income-expense model* is the next page covered by the model. This provides a breakdown of various profits and expenses that would be expected to be seen from both granulated as well as pelletized fertilizers. Each column estimates logistics for 200,000 hogs. Finally, it calculates the costs associated per head (hog) and net income per head as well.

Following the *income expense model* are two *Income Expense charts*, one for the liquid and pellet fertilizer. Each provides a graphical view of the associated costs and profits in the respective categories. One apparent difference between the two is that the net income per head is larger for liquid fertilizer, using the default scenario, with 28% versus 21% for the pelletized fertilizer.

*Key metrics* graphs for each scenario are also provided. They cover such metrics as the previous category, only in dollar amounts. Some of the categories included are total manufacturing costs, gross margins, other expenses, net operating margins and net income per head to name a few.

One of the main components of the financial model is the *break-even analysis*. This page takes into account the cash burn rate of previously discussed assumptions and the profits that surpass these. In this part, the user is able to change various components of the model to predict how they may affect the

break-even point and profit margins. Correct use of this will greatly help to determine a proper sell price for the fertilizer in such a way that will generate enough cash flow to turn a profit. According to the original rough model, a profit may be turned within the 5<sup>th</sup> month. Care must be taken in determining realistic values for the various components of the analysis, and one may not forget any parts that may be required for the business.

Perhaps a more traditional graph of the *break even analysis*, the *break even chart* displays all the associated costs and profits on a line graph. Here one can easily see how variable and fixed costs tie into the business and just when a profit will be made. Again, care should be taken to ensure that all components are included is the costs section and not parameters for profit margins are overly exaggerated. It would also be wise to include a cushion room, or safety margin, such that any unforeseen or accidentally omitted costs may be covered. One suggestion would be to receive quotes for sections where costs may seem unreasonable or one is unsure of. One deciding factor on the success or failure of Ag Conversions will be how accurately the sales forecast and start-up costs are estimated. Because of this, it would be beneficial to take more time to, as *accurately* as possible, model the various components of the company before seeking venture capital.



Chart: Break Even Analysis

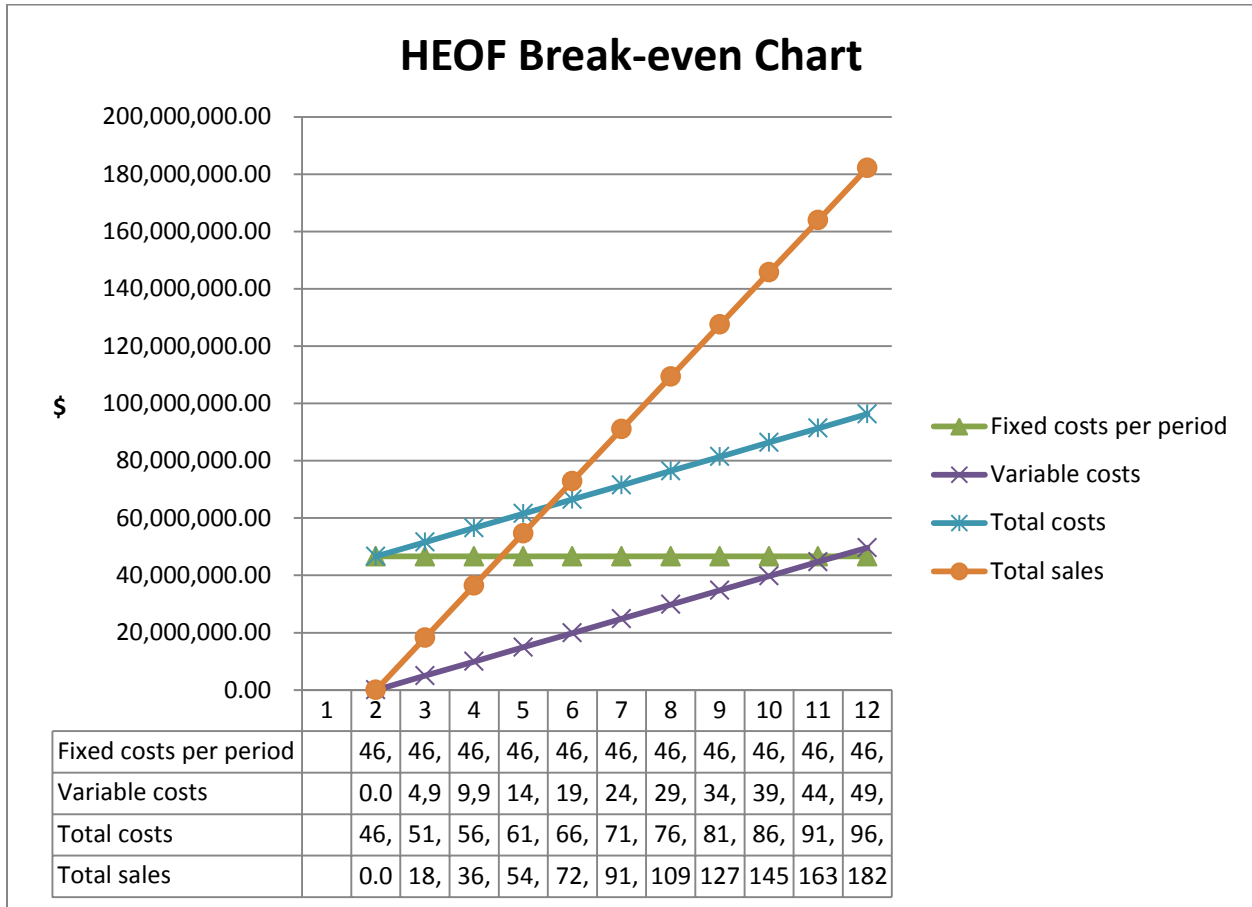


Table: Financial Summary

000's	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	30,660	45,990	68,985	103,478	155,216
Operating Profit	9,943	14,914	22,371	33,556	50,334
Cash Flow	3,276	7,776	11,305	16,599	24,539
Assets	16,997	29,234	47,590	75,124	116,424
Jobs	114				578
Hogs	40,000				200,000

## 8.1 Concerns regarding the Financial Document

Upon reviewing the financial document, there several gaps where aspects of the business are missing. One major component that seemed to be omitted was the cost of building a warehouse and housing facility for the “G” and “L” plants as well as utilities and insurance for said buildings. The conversion and packaging units cannot be standing outdoors exposed to the elements and workers would most likely prefer to be employed within a facility, especially during the winter. Also, the headcount on the employees totals only 15 which will certainly change within the first year of the business. It is questionable if this was taken into consideration for the latter sections. For a selection of documented costs that may be expected, please refer to the *start-up costs* section of this report. Continuing with the “L” unit section, the price for the 4” cavitation unit should be discussed more thoroughly as a *cost*, with no profit margin, of \$135,000 was provided to us in a previous call.

Selling prices of fertilizer are going to be a crux of the success and adoption of Ag Conversions’ business. Careful thought and consideration as well as research must be taken to provide a competitive product that will be *comparable* to synthetic fertilizers. If the price is higher than traditional fertilizers, we must be ready to defend it with a list of benefits that make it appealing and worth buying. Conversely, if the cost is lower, there must be something that mitigates the possibility of skepticism.

## 8.2 Start-Up Funding

Start-up funding for Ag Conversions would mainly come from valued investors and venture capitalists with some contributions from existing businesses of Amiran Co. It is estimated that to cover Ag Conversions start-up costs, approximately 6.8 million dollars. These funds will cover start-up costs consisting primarily of land purchase, plant construction, establishing a trucking business or contract with a trucking company, and a period of employee training. During that period of time, the South Dakota plants would not be processing hog waste and producing fertilizers. However, once these facilities are up and running and a successful marketing relationship is established, a significant profit will be generated.

Table: Start-Up Funding

<i>Start-up Funding</i>	
Start-up Expenses to Fund	\$2,777,500
Start-up Assets to Fund	\$4,030,000
Total Funding Required	\$6,807,500
Assets	
Non-cash Assets from Start-up	\$1,030,000
Cash Requirements from Start-up	\$3,000,000
Additional Cash Raised	\$0
Cash Balance on Starting Date	\$3,000,000
Total Assets	\$4,030,000

<b>Liabilities and Capital</b>	
Liabilities	
Current Borrowing	\$0
Long-term Liabilities	\$0
Accounts Payable (Outstanding Bills)	\$0
Other Current Liabilities (interest-free)	\$0
Total Liabilities	\$0
Capital	
Planned Investment	
Owner	\$0
Investor	\$0
Additional Investment Requirement	\$6,807,500
Total Planned Investment	\$6,807,500
Loss at Start-up (Start-up Expenses)	(\$2,777,500)
Total Capital	\$4,030,000
Total Capital and Liabilities	\$4,030,000
<b>Total Funding</b>	<b>\$6,807,500</b>

### 8.3 Important Assumptions

Key assumptions with full start-up funding include:

1. Correct appropriations of time for land purchase and construction of facilities, from breaking ground to fully functional with trained employees
2. A successful marketing campaign with buyers and relationships with re-sale companies, co-ops, and international interests
3. Successful relationships with farmers

## **Appendix**

**Gantt Chart (Attached Image)**

**Sales Forecast (Attached Excel File)**

**HEOF Income Expense Model (Attached Excel File)**

## V. Conclusions

### Introduction

This following section provides a summary of observations made concerning the start-up of Ag Conversions. Contained in the conclusions are suggestions of each section of the company as it pertains and how we, as an outside source, see changes that should be taken into consideration.

### The Company

Before setting out to build the first “L” and “G” plants, the company should consider “testing the waters” of South Dakota as a Beta site. A single *temporary* “L” plant that also manages its own packaging on site should be created to generate cash flow before an actual structure is built. This can be used as a learning opportunity to find what will be needed for a more permanent facility that will be built in the near future. The first three plants should be constructed in such a way that they can handle the packaging on-site and after it is deemed necessary, a centralized facility may be created to streamline the operation. It should be questioned, though, if it is more beneficial from a monetary perspective, to even have a “G” facility. It seems that the need to truck waste and fertilizer multiple times before it reaches its end location may be too costly.

Structure of and its operations should be horizontally integrated. It will be more beneficial if did not have to control all aspects of the process. For instance, trucking should be handled by an outside source as it will become too much of a burden to file permits, deal with laws and manage all the operations of trucks. For this reason, the company should decide on what parts of the operation it would like under its control, and what should be outsourced.

### What is Being Sold

While Ag Conversions is making a profit and is very interested in selling fertilizer, it should not forget that it is in the business of *removing hog waste and associated smell problems*. Losing sight of its mission and goals will result in the failure and eventual demise of the business. Not servicing even a single farm may result in loss of support or customers as farms form a tight-knit community. In general, it would be wise for top employees to keep this thought in mind.

The chemicals are stated as free throughout the plan, but it could be wise to charge even a discounted price for them. It may be that farmers would be willing to pay for this and have their waste removed. Research will have to be conducted to find out if this is the case as well. One of the issues with giving away the chemicals for free may be that the farmer will not want to give his waste away, there will have to be a conditional agreement that states that chemicals are free only if waste is provided in exchange. With fertilizer prices on the rise it may be that hog waste, as odiferous as it may be, is becoming more popular to the farmer.

One crux of the support from the state of South Dakota is the 300 jobs that it would like to see. Not fulfilling this requirement, possibly even soon enough, could result in a diminished or lack of support.

## Marketing

The state of South Dakota should be used as a socializing element in their start-up phase. Making use of the resources that South Dakota has to offer, it will be many times easier to obtain customers for the fertilizer sold as well as raw waste. If expansion to other states is sought, if at all possible, that will follow this model in exchange for employment opportunities.

## Competition

Fertilizer companies will be direct competition to. To ensure that this will be a successful venture, the company will need to ensure that it has *buying customers* of its fertilizer before even attempting to set forth with building up the business.

Being able to answer to the threats and actions of said fertilizer companies will need to be a priority. Whether this is in the form of pricing or marketing strategy, the company must always be ready.

## Sales

Selling fertilizer will be the main provider of steady cash flow. Maintaining these sales will be crucial for the company and must be planned strategically. Dealing with the seasons will be a challenge that must be overcome such that there are no spikes in sales with regular drops as well. To counter this, one can sell with the different seasonality of regions nearby, i.e. selling north and south of South Dakota.

At the start of the venture it may be difficult to find enough waste to convert to fertilizer if it becomes popular faster than the free or reduced cost removal. It will be a perilous game to be played with two direct dependencies between the fertilizer and hog waste- a shortage in either one could lead to disaster and it must be thought out well in advance how to deal with this.

## SWOT Analysis

The above conducted SWOT analysis should be taken seriously and all weaknesses mentioned should be thought of in detail. Being able to deal with these will be a great tool and asset to. It will ensure the success of the business and even set it above its competitors.

## Website

Use of a website is optional, though having an information portal that customers have access to will be beneficial. Use of it as a marketing tool will most likely not be as successful as the states help and therefore may not be sought as a viable expense. Once a brand name has been created, it may be beneficial to add a site that is accessible by investors or possible interested companies to look professional.

## Management

A start-up business runs differently from a mature business. The first phase of the company will be disoriented and should be a learning process. Making sure that the company learns and *listens and*

*adapts to its customers* will be important in the success of this venture. Once the company moves through the different stages of its life cycle it will be important that management techniques and company structure change as well.

### **Financials**

While conducting the research and reading through provided literature, it was determined that there were some aspects in the financials that were missing. One such case was in the HEOF financial model. In the assumptions page for the “L” and “G” plants there was no cost calculated for land or construction of a facility that would house the machine and processes. Such omitted data will be crucial in determining that accurateness of the plan and great care should be taken not to forget such details.

One of the other issues with the model is an inconsistency. In a conference call it was said that a machine would cost 135,000 dollars and in the model it was listed as 35,000 dollars. Again, such information must remain accurate throughout to make a convincing case to investors.

### **Future of the Company**

Ag Conversions has huge potential for success. If properly managed and operated, it will see large growth, in South Dakota especially. Expansion may become an option but it should not be handled too soon or too late. Finding just the right time will be up to management, but must be thought of carefully. Taking too much on and losing focus or not completing tasks is one of the biggest threats that we see for the company. Making sure that operations run smoothly in the first state will be imperative before a move is made to another of the top producing states.

Some questions that arise are how to deal with large farms? One could sell or lease a unit to the farm to convert waste and just sell chemicals for profit. How much potential does this have for money making and will the farmer accept this? These are questions that will need to be answered on the way and can only really be found out through trial.

Another direction that the company can go in is to make a mobile conversion unit on a flatbed truck. This could be trucked around the state and be used for a day or a week at some determined price. Chemicals will be sold and a rental fee for the unit will be collected. This removes the need for contracting truckers to move waste to several facilities and takes Ag Conversions out of the business of fertilizer. Of course this is a drastic change from the original plan, but could be implemented in parallel to other operations.

Moving to other countries could be a large potential for sales. There are many third world countries that are in dire need of fertilizer and could benefit greatly from the process. In another scenario, Ag Conversions could research and advertise their process for other animal wastes if hog waste does not become a successful venture. Whatever the case, there is so much potential for the process that there should be no reason that this does not become successful.

## **Appendix**

Farm Fertilizer Prices (Attached Excel File)



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