Business Case: Disclosure Statement 2023

Lockyer Valley FOODS

Lockyer Valley Fruit & Vegetable Processing Company Limited
Contact for more information:
office@lockyervalleyfoods.com.au or 1300 223 565

PLANT DESCRIPTION BUILD AND ENGINEERING FEASIBILITY STUDY REPORT

Lockyer Valley Fresh & Frozen Fruit & Vegetable Processing Facility
Withcott, South East Queensland

Development Application Approved by Qld Government &
Lockyer Valley Regional Council December 2022

The Lockyer Valley Fruit & Vegetable Processing Company Limited
ACN: 602 242 600 As at April 2023

Colin Dorber, CEO & MD, Lockyer Valley Foods and reviewed and approved by Lester Underdown. MBA, Masters Project Management, BSc. Author of the principal report - Innovative Process Technologies Pty Ltd. ABN 21 653 975 716

Disclaimer

The original report was prepared by Innovative Process Technologies PTY Ltd (IPT) for The Lockyer Valley Fruit & Vegetable Processing Company (LVFVPC Pty Ltd) which is now a Limited (unlisted) Australian Public Company, using the Business Name Lockyer Valley Foods®.

This update of our project to build a state of the art Food Processing Facility in Withcott Queensland follows the approved DA being published on 14/12/22 and the planning of Operational Works, aimed at having major earthworks/stage 1 build program including road and car park construction commencing mid-2023.

It is based on technical data previously supplied by LVFVPC Pty Ltd, and the best available knowledge at the time of publication with assumptions derived from external technical reports and consultant work by IPT, based on the aggregate of that data. This edited version contains the key elements of the original Report and, incorporates an update on the recent negotiations with respect to a proposed investment for a capital sum of $3 million, one for $12.5 million for use in the operational works and construction of the buildings, plus discussions for an additional $2 million share purchase, together with signing of the now finalised long-term lease (of up to 40 years) for the subject land -approx 55 Hectares; (incorporating a right to buy at an agreed set price, for five years, from 1 July 2022). All proposed investments identified have been reaffirmed at publication date, including lodgment of signed share application for the major cornerstone investor.

IPT and the Company have exercised due care consistent with the level of accuracy possible at this level of project assessment and it has used professional judgement and reasonable care in all its statements. However, no warranty should be implied as to the accuracy ofthe estimates or other values as all values and estimates are only valid as at the date of the report and will vary over the passage of time. Parts of this Report (including this February 2023 edited version) contain data supplied by third party contributors, as detailed.

While the contents of those Parts have been reviewed by IPT and LVFVPC Limited for inclusion in this updated Report they have not been fully audited or sought to be verified by either author. IPT is not able to and does not verify the accuracy or completeness of, or adopt as its own, the information and data supplied by others, and it formally disclaims liability, damages, or loss with respect to such information and data.

Given the fluid nature of this project and potential changes in key external elements beyond our control often driven by government policy and or economic change, then in respect of all parts of this Report and the related Excel financial spread sheets, (whether prepared by IPT or not), no express or implied representation or warranty is made by IPT, or by any party acting for or on behalf of IPT to any third party that the contents of the Report are verified, accurate, suitably qualified, reasonable, or free from errors, omissions or other defects of any kind or nature. Third parties who rely upon this Report do in recognition that they do so at their own risk and IPT disclaim all liability, damages, or loss with respect to such reliance. IPT also disclaims liability, damage, and loss to LVFVPC Pty Ltd and third parties in respect of the publication, reference, quoting or distribution of the Report or any of its contents to and or reliance on it, by any third party.

This disclaimer must accompany every copy of this Report and must be read and understood in its entirety by any person or entity subsequentially acting upon it.

Contents

Executive Summary	Page 4
Introduction	Page 8
Scale	Page 9
Key Points	Page 12
Location	Page 13
Key Land Attributes	Page 15
Culture Development	Page 16
Frozen Fruit & Vegetable Line	Page 17
Specialised Produce Preparations	Page 22
IQF Deep Freezer	Page 27
Refrigeration Transport Loading System	Page 33
Bio Waste & Wastewater Treatment	Page 34
Canning Line Opportunities	Page 37
Powder Line Opportunities	Page 38
Tomato Processing	Page 41
French Fries Line	Page 42
Operation Description	Page 43
Lifestyle Considerations	Page 46
Expenses OPEX	Page 46
Assumptions	Page 51
Summary	Page 54
Questions & Answers	Page 55
Innovation	Page 56
Blue Sky	Page 57

Executive Summary

Innovative Process Technologists Ltd in conjunction with Lockyer Valley Foods, has further reviewed the various reports and analyses for their proposed fruit and vegetable processing facility. The investment opportunity is a state-of-the-art food processing facility in the heart of the Lockyer Valley in Southeast Queensland. It uses conservative and deliverable estimates, especially in relation to product demand, which is based on a thorough market research program and discussions with major retailers.

The project is being developed in stages to ensure staff skills and operational systems have been perfected and to ensure that the supply of produce will match the plant's production capacity. The future supply of horticultural produce is confidently assured noting the current output of the Lockyer Valley is known to be less than half of its identified potential. The first stage of production will involve installing a deep-freezing line to process peas, beans, broccoli, cauliflower, onions, potato, beetroot, zucchini, carrots, capsicum, and sweet corn.

Initial target capacity for Stage 1 will be 70,000 tonnes per annum on a growing one to three-shift basis. The produce processing equipment is common to the expanding stages of the project and will be required for other forms of manufacturing, such as powders, juices, vacuum packing, ready meals, and canning. Construction is anticipated to take between 15 months and two years from the point that funding is in place. A lease has been signed for 40 years (on agreed terms) for the subject land at Roches Road, Withcott, in Locker Valley, Queensland. The terms of the lease arrangements in the grant of an option to purchase the land from its owner within five years of the commencement date of the lease and a known and pre-agreed price.

In addition, the Company has negotiated terms of a subscription agreement with an entity associated with the Landlord pursuant to which the Offeror has offered a $2 million equity investment in the Company- with the investment to occur when building works commence. The DA has been approved and operational work plans are underway with lodgment to Council due mid-May 2023, and approval sought by end June 2023, with earth works commencing July 2023. Funds of $1.55 Million were expended to fund and lodge (Done June 2022/Approved December 14, 2022) the Development Application and meet some of the related costs; including technical design, and architect and/or engineers drawing and plans; and the company operational costs from October 2021 to December 31 2022. The Queensland Government has also approved (under the National Cooperatives Laws (Queensland) establishment of a Cooperative – Lockyer Fruit & Veggie Cooperative Ltd - which has set a target of 20,000 $1000/$500 Associate Members by June 30 2024. It (the Cooperative) has already as part of its remit, acquired a substantial number of shares in Lockyer Valley Foods®.

Ongoing discussions suggested that in addition to a major revamp of the domestic market, our facility could provide an import replacement target of over 70% of current imports over time. Lockyer Valley Foods have collaborative parties who have insisted that they have export buyers, for all that the plant can produce, However Stage 1 is to be focused on meeting new and replacing current import demand in the Australian market . Future planning requires the current project to double to meet this potential. (It has been designed to achieve this goal) In the first full year of frozen sales projections for one shift per day caters for 39,916 tonnes in the first year rising to 79,832 tonnes from two shifts per day, for year two, 120,000 year three from three shifts per day. Fully optimized with processing equipment and operational design the plant could potentially process 193,000 tonnes, an increase potential of 60%.

Matters of interest since this report was first prepared show the Construction Spreadsheet prepared for Stage 1 with a 13-month to 18 month build program time frame confirmed (after approvals received).

Frozen sales projections are based on indicative volumes from only two major supermarkets for import replacement. (Subsequent buyers' requirements increase these figures to over 100,000 tonnes).

Careful consideration has been given as to the seasonality of the produce. Many more detailed spreadsheets are available which have more recently been prepared, including a recent detailed spreadsheet containing the job allocation and pay scales, for every individual operator in the plant.

The Building No: 4 – Processing Facility incorporating Frozen Line (Phase One)

The design of the main processing floor which is 70 meters wide, and 123.5 meters long built as portal frame like an aircraft hangar without intermediate columns. The floor concrete is water-proof concrete which does not deteriorate in the presence of food acids. The portal frames allow for the relocation of the processing lines without considering columns.

The processing floor is elevated by 3.5 meters from the ground level below the main processing floor, into which all the electrical, energy and waste removal systems are located. This facilitates the installation of new systems without interfering with the currently installed systems on the production floor above. Usually, these systems are in trenches or in the roof which prohibit redevelopment, because of the prohibitive cost of interrupting processing while the old systems are removed, and new systems can be installed without disrupting the existing production systems. The materials used in the construction are designed to last for over 100 years.

Profit Assessments

Calculations for the potential profit for each production line have been conducted. Lockyer Valley Foods have quotations from existing international suppliers for industry standard installations. IPT has analysed their offers and designed a completely new production management approach, some of their offers using existing technologies which deliver very efficient solutions consistent with the reduction in capital costs claims.

Wholesale Pricing

This Report's methodology of wholesale price calculation is well understood in the industry when dealing with key major retailers. Lockyer Valley Foods has no data on other entities and its figures are based on meticulous calculations and discussions conducted with experts in the field.

Staging Plan:

Stage 1:

Operational Works Design, Lodgment, and obtain (Post DA Approval) Approvals. [Works include project design management, architect plans, civil engineering planning and design, all project wide schematic planning and finalisation of the ultimate site layout and full incorporation of a holistic design]. Commence major earth works, road network, car parks, retaining wall, and environmental works; and commencement of major works for Building 4 – The Frozen Facility and Building 2 - Plant Room.

Building 2 (Plant Room) Total GFA: 1,726m^2
Building 4 (Main Packaging Facility) Total GFA: 37,243m^2

Staging plan from our Stormwater Management Plan:

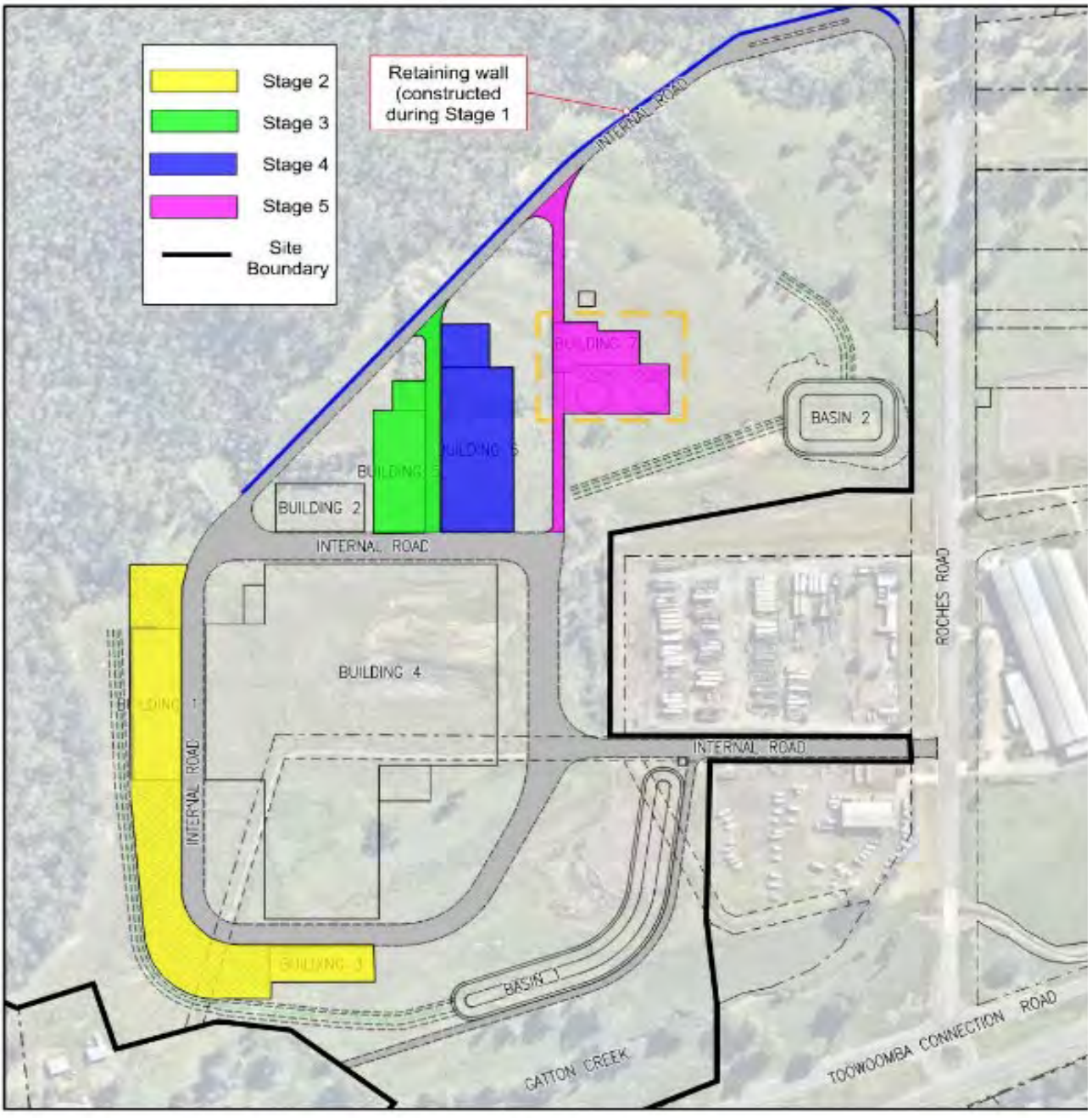


Figure 5: Staging plan

Stage 2 Juicing & Powder Production Line

Stage two will involve the installation of a juicing line and a powder producing line. This stage will involve converting currently unsaleable, poor visual quality produce, which is currently left in the paddocks, into juices and powders. It is anticipated that local farmers will benefit from the sale of this produce by at least $30 million per annum.

Lockyer Valley Foods are designing for 150,000 tonnes of this rejected produce to be converted to juice, and powders. Species being considered are beetroot, carrots, pumpkin, tomato, onions, garlic, celery, ginger, turmeric, grapes, apple, mango, and citrus. The salvaged produce will be pasteurised using state of the art low temperature preservation technologies which enables Lockyer Valley Foods to store the preserved pulp in aseptic bulk containers in open air storage for up to one year.

The low temperature preservation maintains the essential nutritional benefits of the produce, only found in freshly squeezed products. This second stage will cost an additional $20 million. In the first year of operation, it is budgeted to produce 3.1 million kilograms of powder rising to 9.5 million kilograms when running three shifts. Anticipated indicative powder revenue will begin at $40 million rising to $155million when running three shifts.

Stage 3 and onwards (see pages 37 on for more detail)

Metal Can Manufacturing Line (shown as Building 1)
Lockyer Valley Foods plans to expand the capacity of the metal can manufacturing line to offer metal cans to selected manufacturers to increase the scale and efficiency of their plant as well as generate a significant profit centre.

Bio Methane Plant Opportunity
Lockyer Valley Foods has designed a plant to efficiently collect and use all the bio waste being generated from the plant. Also, they plan to accept specific bio waste from individual manufacturers and city councils. This waste is high in fats, oils and proteins which result in the production of higher volumes of bio methane per ton of waste when compared with digesting animal excrement.

The planned tonnage is 190,000 tonnes of Bio Waste.

Introduction

Interested stakeholders involved in the Lockyer Valley have decided to build their own facility in the valley to fill the void left by the relocation of Golden Circle. In this endeavour they were strongly supported by the Lockyer Valley Regional Council in Gatton, headed by the late Mayor Steve Jones. The council made land available to Lockyer Valley Foods through a tender process only to learn a year later that Inland Railway was proposed to pass through the site. At this point Lockyer Valley Foods began to look for other suitable land for the facility, resulting in a very suitable site at Withcott being found. Lockyer Valley Foods has been encouraged to implement the proposal by the Retail Groceries Business because they are all being harassed by their customers to replace imported products with home grown products. The volumes used in the feasibility study reflect the levels of interest shown by these retailers. Because the volumes are large Lockyer Valley Foods have been able to benefit from the economies of scale which has made their wholesale prices locally and internationally competitive. The identification of the land at Withcott (now secured) provided the impetus for the successful Development Application.

The points of difference with the products from this project are not in how flavoursome their beetroots are, or how sweet the tomatoes taste, because essentially it is hard for the average consumer to tell the difference. The points of difference for this project will be delivered through promoting the way Lockyer Valley Foods look after the land, support the growers, minimise wasted manufacturing effort, conserve and recycle water and to utilise the bio-waste stream, to produce methane gas, for electric power and steam generation. These are all features that the modern consumers are looking for, to meet their expectations for sustainable food production. All achieved with price points that meet consumer's expectations.

Lockyer Valley Foods plan to advertise these qualities through their engineering narrative, which will form the mainstay of their marketing plans. The whole enterprise has been designed to be photogenic and to look amazing on social media platforms. The direction marketing is heading is to provide platforms, which can be accessed from the produce on the retail shelves and online, so a photogenic enterprise designed to look great for marketing and illustrate what the customers consider to be a virtue and is the guiding design principle for this project.

Lockyer Valley Foods began their design brief by interviewing the farmers to record their experiences in dealing with previous processing companies and to determine how procedures could be improved in the future. This exercise resulted in the adoption of an integrated business plan, involving the steps that farmers and the processor could adopt for the mutual benefit of both parties. Having identified the present industry constraints, Lockyer Valley Foods crafted an enterprise-wide design, which would benefit all stakeholders. The proposal contains many innovations and alternative solutions, not currently employed in food processing.

The solutions while innovative in the food processing industry are mature technologies, present in many other industries. Respected industry commentators have embraced the proponent's concepts as being close to ideal.

Scale

For any industrial enterprise the scale of the enterprise is vital. The vital aim is to ensure that the equipment selected and the design input, ensures that the pieces of equipment going to create the whole enterprise are fully integrated so that all pieces of equipment are always operating for 90% of the available time at 95% of their design capacity. The ultimate design capacity in this projects case have been predetermined by indicative design numbers provided by our current potential customers. Their volume requirements have formed the basis of our equipment selection.

The Opportunity

The proposal is for the development of a state-of-the-art, fruit and vegetable processing facility, focusing initially on frozen vegetable products, at Withcott in the Lockyer Valley in Southeast Queensland. The project will be developed in stages to ensure an orderly progression of produce supply and staff training. The first stage will be a deep-freezing line, capable of processing a wide range of vegetables, now currently available in the Lockyer Valley and surrounding districts. This will deliver a final packaged and frozen product volume of 120,000 tonnes per annum on a three-shift basis. All of which have been identified by the market demand, as suitable for by the existing Australian retailers, seeking to displace imported frozen products.

It is the proponent's intention to eventually double the size of the frozen line, to expand into the frozen produce market. Lockyer Valley Foods cooperative marketing and production associates are adamant that they have pending orders for as much produce as Lockyer Valley Foods can deliver capitalising on the international perception that Australian produce is "safe" and of the highest nutritional quality.

An observer's first reaction is that Australia cannot compete in the international space, because of our higher labour costs. This is usually true because Australian businesses overlook the criticality of developing at scale. Lockyer Valley Foods analysis reveals that its direct labour costs are less than 8.0% of the wholesale price of their frozen products, highlighting the benefit of recognising the effect that scale (and the introduction of integrated world class technology & equipment) has on the success of this project, by spreading labour/processing costs over a higher volume of product.

The management objective is to achieve an Overall Equipment Effectiveness (OEE) of 85 which means that the plant must operate for 90% of the available time at 95% of its design speed with 99% accuracy. This is achieved by streamlining the current approach to equipment operation, which usually requires extended periods of cleaning between processes, often taking as long as the operating period. In the proponent's case, many of these cleaning regimes do not require labour and can be performed in 10% of the operating time, without staff being involved. The proponent's mantra is that it is not the cost of production that is the issue, it is the cost associated with not producing. It is this management approach which is enabling this project to achieve cost parities with international manufacturers and eclipse its local competitors.

OEE is a management concept not an engineering concept. OEE principles are used to assist engineers in selecting the correct suite of machines to achieve the OEE target of 85.

As outlined in the introduction, the opportunity to capture the benefits of scale are present from the outset. These savings have been made by the multitude of innovations employed in this project which minimise the periods of non-productivity normally associated with equipment cleaning, and inefficient double handling of produce. New technology reduces total staffing, reduces total staffing downtime per unit, creates efficiencies re cleaning times etc. Locations perfect for initial crop production selection and reduced transport time from harvest to processing, but also access to long term stable, quality labour force, most of whom will have close contact to the land, also offer measurable benefit to all involved.

The second and subsequent stages will involve converting the current considerable tonnages of produce normally left behind in the paddocks, into valuable by-products, having been graded out for poor appearance. This resource will be recovered and converted into a wide variety of juices and powders. The proposed plant size will receive 150,000 tonnes of these normally wasted products convert them to juices then into powders. This will be of considerable economic benefit to local growers converting previous significant waste to their economic advantage.

As the plant is bedded down and staff training is in place, Lockyer Valley Foods will expand into other forms of packaging involving canning, pouches, vacuum formed trays, ready meals, and juices. Juices are of interest because they enable Lockyer Valley Foods to employ new forms of preserving technology which does not involve pasteurising heat.

These processes achieve long shelf lives at low temperatures without degrading the nutritional values of the juices. This is in line with the international perception of safe, healthy food, which delivers this project its competitive edge with significant economic advantages. Lockyer Valley Foods also intends to convert the considerable tonnages of bio-waste into methane, which will power the project's gas engines, these will generate theelectricity to run the plant.

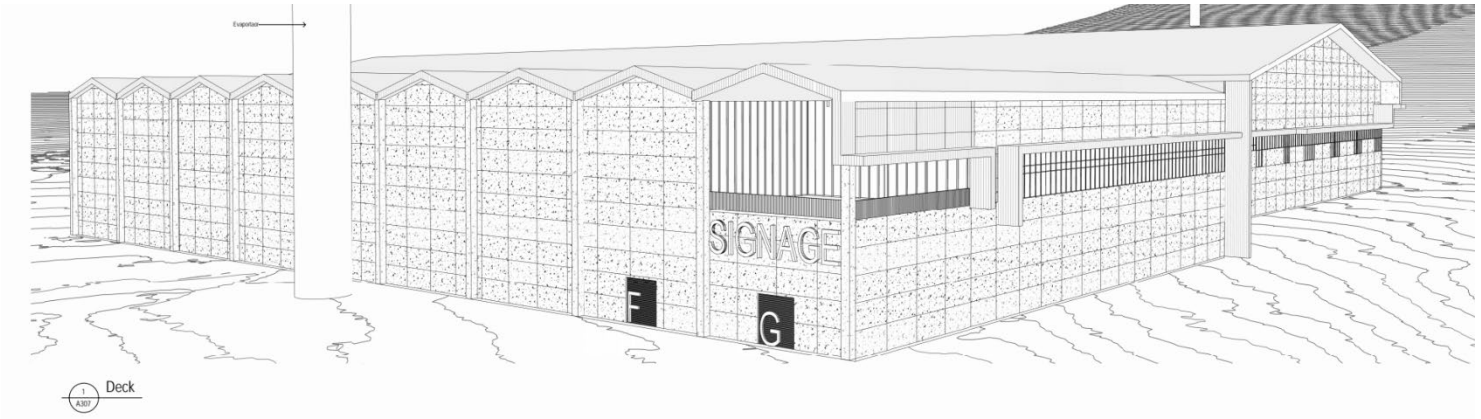
The residue from methane production is a high-quality sterile fertiliser, which will be applied to local horticultural projects. Lockyer Valley Foods have discussed converting the Lockyer Valley Regional Councils green and food service waste into electricity at the plant. It may also be possible that Toowoomba Council will also have a supply of food service, green waste, and other convertible waste that the project can convert to bio methane. Wastewater management is a feature of this plant, with onsite water harvesting and recycling of all the plants' water. The remediation of the water is coincident with the methane production. Waste heat will be collected from the gas engines at 250°C and used to generate process steam, resulting in energy conversion efficiencies approaching 90%.

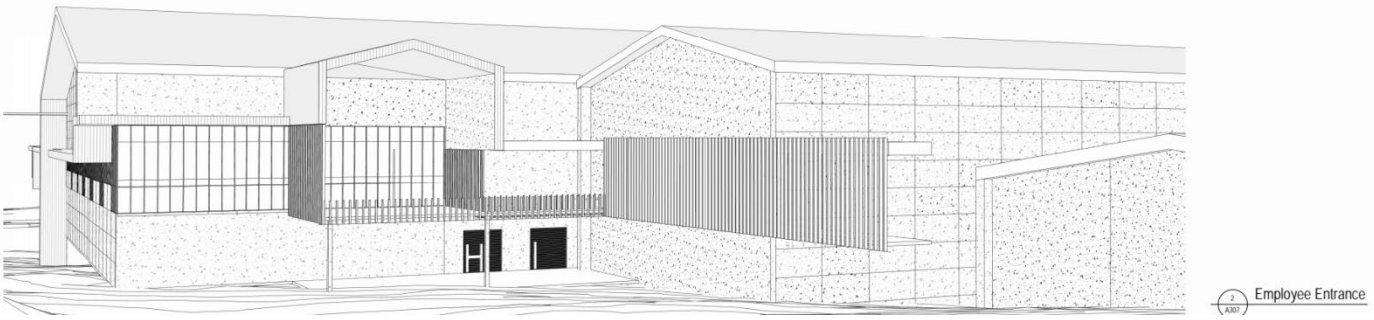
Once the harvested energy has been used in a high temperature steam generating applications, the residual heat will continue to be employed in an energy cascade throughout the plant, down to the lowest practical application temperature of about 50°C, being temperature controlling the methane production tanks, by circulating hot water.

Stage 1 staffing levels will be at least 145 people, on site for the day shift and 70 for each subsequent shift. When the additional stages as outlined are in place, a staffing level of 300 to 500 plus people is anticipated on site. Models used by by the Regional Council suggest Southeast Queensland employment opportunities will exceed 2500 extra jobs as the result of this enterprise. Revenue generated by the enterprise when stage 1 is fully underway will be at least $324 million per annum. When the subsequentstages are completed, the projected revenues are projected to be over $1500 million. The Regional Council's economic forecasting software suggests an economic benefit to the Southeast Queensland Region of at least 2.1 billion dollars.

Key Points

- Stage 1 frozen produce facility with 120,000 TPA capacity over three shifts.
- Proposing to freeze sweet corn, peas, beans, cauliflower, broccoli, capsicum, onions, zucchini, beetroot, and carrots.
- Start-up target 39,916 TPA frozen product, rising to 79,832 TPA by the beginning of year two.
- Sales at the end of year one $99million, by year three rising to $311 million for three shifts with over 40% Operating Profit.
- Well-established market opportunities with significant interest in developing to contractual obligations already identified.
- A wide range of opportunities for Government Grants (or equity funding under the National Reconstruction Fund) Research & Development Government rebates.





Location

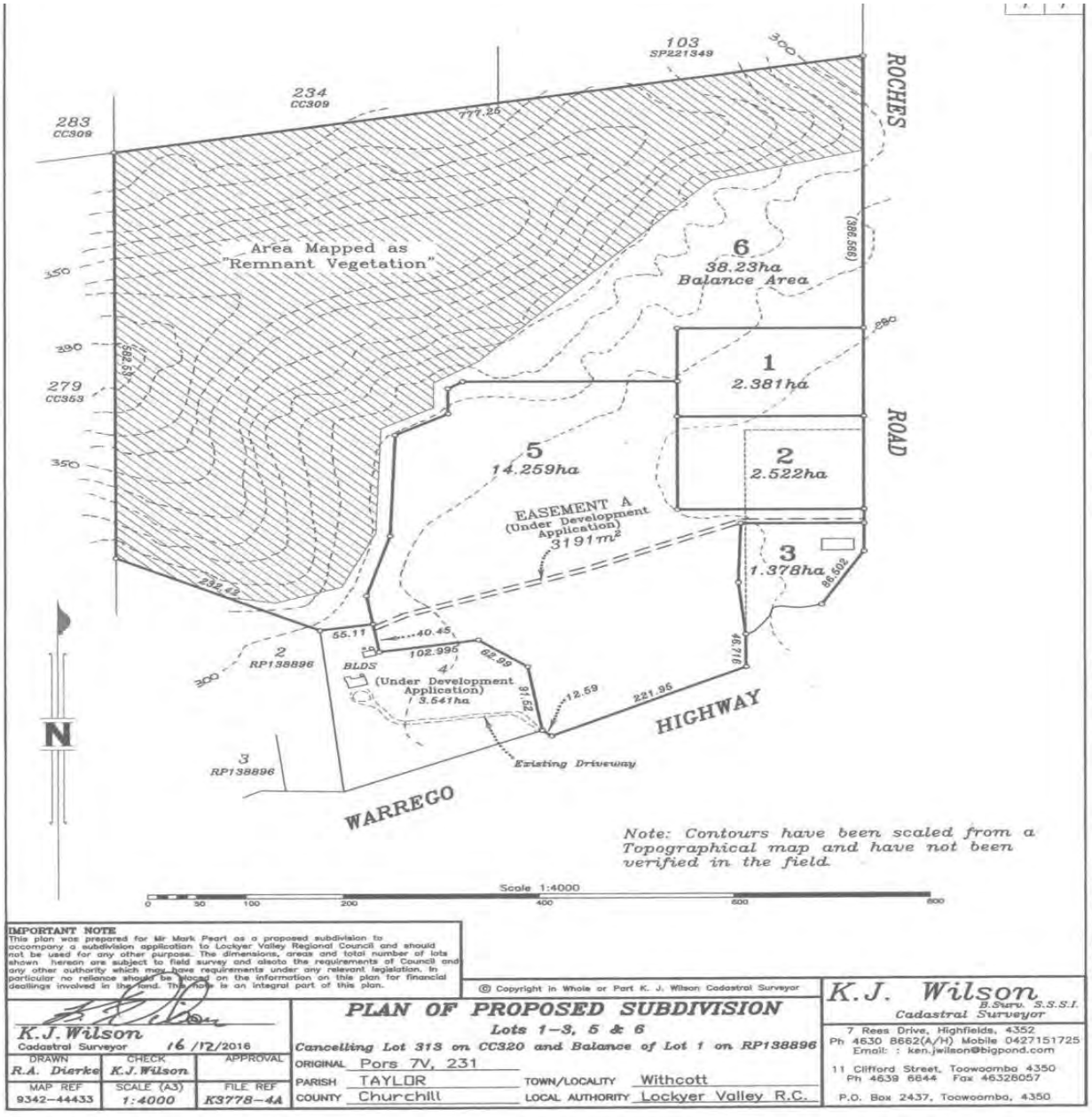
The project will be developed on land already zoned industrial on the Northeastern side of Withcott in the Lockyer Valley on the western side of Roches Road. (The blue dot on the map below).

Fig 3. Map showing site location of the project.

By road it is only 9.6 km to Toowoomba, 28.7 km to the new Well Camp International Airport, on the western side of Toowoomba, less if the new Range Crossing is taken and 112 km to Acacia Ridge railway transport hub in Brisbane. This is a standard gauge railway connection to southern Australian states. The land in question has access to the Warrego Highway by way of a pre-existing B Double access island, dividing the two highway carriageways, as shown on the following map.

The land begins at the left-hand margin of the map and extends to Roches Road, on the right. A section of the site fronts the Warrego Highway and continues almost to the top of the map. The total land area is 51.4 hectares, being Lots 5 and 6 on the preceding siteplan. The proposal will occupy. 35.0 hectares of the site with the balance of the suitable land to be used for companion industries and the land unsuited for industrial development, the steep wooded area, has been identified by Lockyer Valley Foods for Koala/Echidna conservation habitats.

It is the proponent's intention to locate the proposed buildings at the start of the steeper areas on the land because the building is two stories high and will benefit by using the contours to provide natural ground access to both levels. It has also been calculated that the bulk earthworks to convert about 6 hectares of this low value steeper land to 6 hectares of high value level, terraced land, will cost an estimated $600,000 plus suitable retaining walls and result in an anticipated increase in land value.



Lockyer Valley was chosen because it is one of the world's premier horticultural farming areas in the world, being rated the 7th most productive area of land. It is in the Centre of production and is close to rail, air, and ocean transport. It is also well serviced by supporting businesses and a significantly trained labour pool.

Key Land Attributes

- **Seventh most fertile farming area in the world. Containing rich black soil.**
- **Located above an underground aquifer, virtually drought proof.**
- **Two crops per year, farming all year round.**
- **Resulting in factory being only one third of the size of canneries with usual three-month growing season and leading to economies of scale, higher processing opportunity and significantly better and sustainable profits.**
- **Selection of complimentary crops to ensure year-round production.**

Culture Development

The enterprise does not yet exist. Usually, a project of this nature will be developed by a major food industry player. There will be numerous employees with decades of operational experience.
Project planning will be undertaken by these experienced employees.

In our case we will be starting from scratch and as such we have developed a plan to overcome this depth of experience deficit. To fast track our team building and experience generating capabilities we propose to build and install as much of the processing equipment as possible.

Usually, a processing line is manufactured off shore and is installed by fly in fly out installers. Once installed these technicians leave site and take their expertise with them. We intend to insist that we install as much equipment as possible and encourage the technicians to stay on at the plant. There have been many instances that we have witnessed, to where the major companies have not maintained an interest in their new plant installation with the result that the equipment never reaches design performance.

Frozen Fruit & Vegetable Line (in greater detail)

The Building (No: 4):

The guiding principle for the design of the processing building is that it must be suitable for the next 40 years of occupation and that the inevitable re purposing of the production lines and processing support systems can be modernised at minimum disruption and cost.

Constraints:

The constraints built into most industrial buildings is that they do not consider whole of life costs, in the changing focus and technologies of the business. These are experienced when businesses expand their operations, only to find that the disruption to the business and the modifications to the building and relocation of the manufacturing lines incur uneconomic change which will eventually result in plant obsolesce and failure. Building the right building to allow for continual upgrading and efficiencies as new technology becomes available will increase the economic life of the site.

To minimise these constraints, the main operating building in this case, has been designed like an aircraft hangar, without supporting columns, 70 meters wide and 140 meters long, eventually about 250 meters long. This allows the business to relocate new and existing production lines without considering the columns, for the whole life of the project. Another constraint is that services, such as drainage, waste removal, electricity, steam, compressed air, process water, thermal oil, and communications are usually installed in ducts and trenches in the floor slab or in the ceiling crawl space. To relocate them for a new layout, routine repairs, servicing, and modernization usually incur considerable cost and disruptions.

When equipment is difficult to service, in slab ducts and drains, they are usually neglected until they cause a complete disruption tothe plant's production. To overcome these constraints Lockyer Valley Foods plan to build the processing lines on a suspended slab, 3 meters above ground level, this will facilitate the unrestricted installation and relocation of these services for the life of the plant. Because of the copious space in this under croft space, systems benefiting from duplication can also be installed. Lockyer Valley Foods has calculated that 12 hours of disruption per year, per processing line, results in production losses of over $468,000 per year, per line, so any reduction in down time is a tangible benefit.

Maintenance:

The undercroft also allows maintenance staff to attend the mechanical services without having to "gown up" to enter aseptic processing areas, if as is usual, the services are in the aseptic processing space. They can also move unrestrictedly underneath the processing lines, without having to manipulate heavy items under or over these processing lines. Maintenance can occur without having to stopoperations. When alterations are required to services, changes can be made in parallel with current production, causing minimum disruption and avoiding staggering costs. Waste vegetable matter from the processors will also drop efficiently from the machines to waste conveyors in the under croft, eliminating forklifts and spills on the floor, usually requiring extra staff to clean up.

The conveyors move the material to the methane processing area without staff. By removing forklifts from the processing floor, the sanitary, polyurethane floor paint is only subjected to pedestrian traffic and lasts considerably longer and is thinner, estimated to save over $480,000 every two years in repainting costs and even more in avoiding moving equipment and loss of productivity.

Fire escape requirements and employee movement is also more easily facilitated, by utilising the under-croft within

soundproof enclosures, as will hot and messy vessels such as cooking oil, uncluttering the work area, and making aseptic cleaning more efficient, as well as making the aseptic workspace more pleasant to work in. Air is conditioned in the aseptic area to 50% relative humidity to minimise the spread of pathogens between workers and between workers and the product.

Drier air desiccates the pathogens which enables them to travel further from the infected person to other operators or product. Air at 50% relative humidity results in the pathogens falling to the floor within a meter or two of the infected people. Waste heat and atmospheric water will be recovered from the processing space using heat pipe technology, which operates using the phase change, as the operating liquid, water, changes from a liquid to a gas, then condenses back to water, to condition the air.

This is a very energy efficient process. The product workflow is designed so that all processing movements only go in one direction until they have completed manufacture. Unprocessed products enter the facility from the east, while packaging material enters from the west, with both manufacturing streams meeting in the middle. Once processed dry packaged manufactured goods leave the site to the north, while refrigerated and frozen products leave to the south. This arrangement streamlines traffic flow, removes traffic flow clashes and ensures the safest working conditions for staff and eliminates double handling.

Produce Receivals:

There are three receivals points in the plant to receive specific categories of produce. Receivals 1, root vegetables, tomato, berries,capsicums and onions, these species will be discharged into 6°C chilled water, either by side loader or end, self-unloading trucks. Side unloading trucks, potential to discharge into water flumes to minimise damage caused by produce falling on hard surfaces. Bulk transport into large below ground, live floor bunkers, of up to 50 tonnes capacity to act as flow buffering and to facilitate fast unloading as well as metered conveying to the processing lines. End loading trucks with live bottoms enable the discharge of delicate produce into water flumes, to minimise unloading damage. Live bottom conveyors can regulate the speed of unloading to synchronise with the ability of the water flumes to transport the produce to the chilled water agitation tanks, for chilling to 6°C to remove field heat. This chilling suspends over ripening and delivers optimal freshness and product quality.

This arrangement minimised impact damage and removes field heat. The produce is air agitated in a 50-tonne capacity receiver forup to 30 minutes to soften adhering soil and to separate stones and tramp metal. From the receivals sump, the produce is brushed,scanned, and graded then stored in size categories for further processing.

Receivals 2, sweetcorn is unloaded into one of two side loading or end loading below ground 50-ton capacities, sweetcorn receivinghoppers. From the bulk hoppers the corn is conveyed to a steam operated, corn husk wilter, which improves the efficiency of the de husking process, especially relevant for sub-tropical varieties of sweetcorn. From the wilter, the corn cobs are conveyed to the de husking machines, located in an open fronted building, because of the unacceptable generation of plant-based dust, which abuts the main climate-controlled, vegetable processing building.

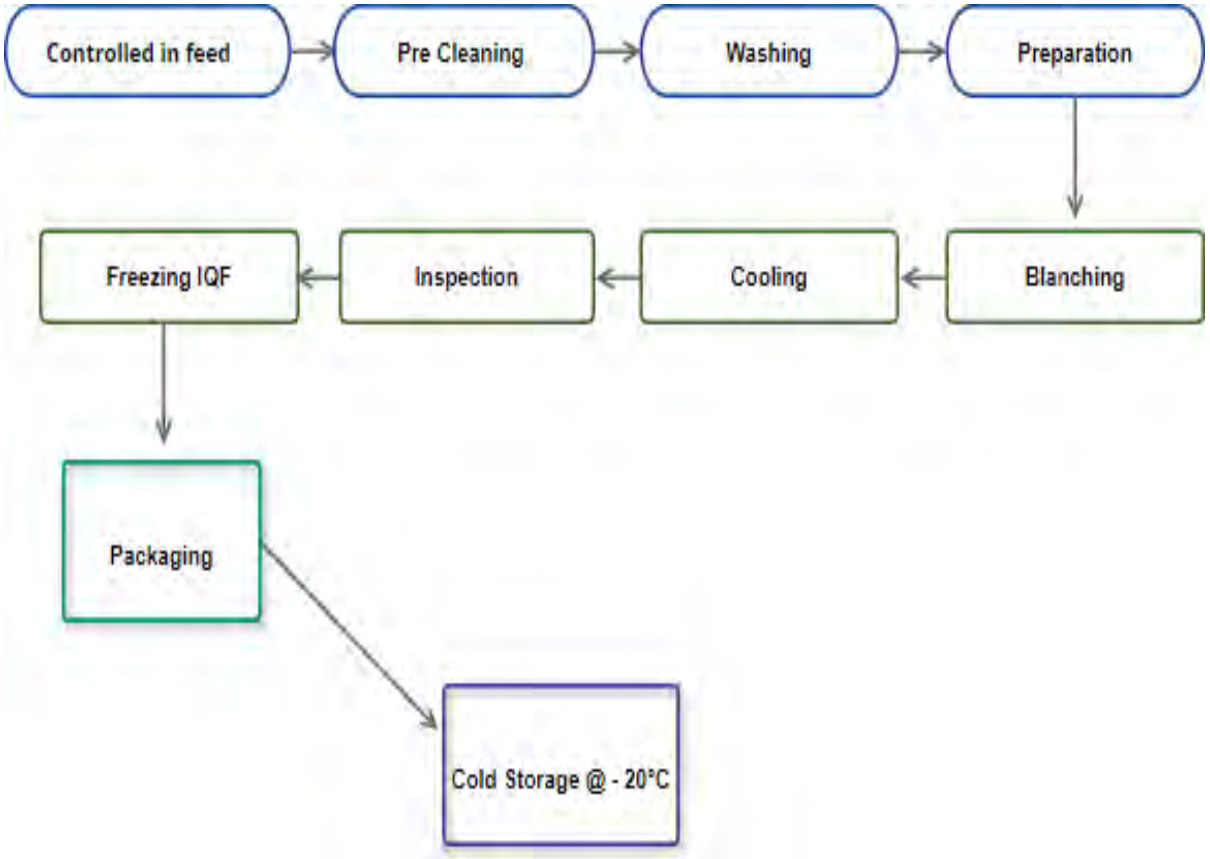
Once husked, the sweetcorn cobs are either directed to a steam blancher for immediate processing or discharged into a spiral feeder, where corn cobs are progressed through an ice slurry bath for 30 minutes to chill them below 2°C, before being elevated into moving storage bins awaiting steam blanching as the day progresses. This process ensures optimal kernel quality by preventing the conversion of sugars in the kernels to starch and lowering the quality of the products.

IQF Individual Quick Freezer

Quick Freezing is the only process whereby virtually all the properties of most of the parent food stuffs, can preserved. This modern technology makes the freezing process very fast, decreasing the size of the ice crystals formed inside fruit tissue thus reducing cell structure damage. This freezing process is possible, thanks to a high velocity flow of air at a very low temperature, that makes every piece of a product float in the air being individually frozen rapidly. IQF also improves freshness taste and nutritional characteristics of food items in comparison with a slow freezing process.

The proponent's future includes producing a wide variety of IQF process products which includes mango chunks/dices, strawberry chunks, pineapple slices and other sessional products.

Process of Flow of IQF



The Technology of IQF involves three Sub Sections

- Processing Equipment
- Individual Quick-Freezing Equipment
- Auxiliary Equipment

IQF Freezers produce extremely high quality individually frozen pieces of fruit and vegetables. The premium results are produced by highvelocity air at -41°C freezing the individual pieces by keeping them in motion and not sticking together. IPT will be manufacturing the IQF freezer for this project, the freezer is 20 meters long with a freezing capacity of 1200 kilowatts. The capacity is 12 tonnes per hour, based on green peas.

Lockyer Valley Foods, as their design principle, have concentrated on the Overall Equipment Effectiveness (OEE), achieving 85. This meansthat the freezer must be operating for 90% of the available time at 95% of its design speed with 99% accuracy. The product, multiplying the three figures together, is 85.

OEE, in the case of IQF freezers, is the downtime attributed to the time involved in defrosting the freezer and aseptically cleaning it.For such a large freezer it typically takes freezer operators up to 4 hours to clean. Usually involving 3 to 4 people using aggressive chemicals to achieve sanitary cleanliness. In the case of the ESM freezer, it will take less than 1 hour, will not involve harsh chemicals, and only involve one cleaner.

To achieve this, the freezer will be fabricated to be steam tight and the internal fittings capable of tolerating steam temperatures up to 130°, this will enable Lockyer Valley Foods to pasteurise the freezer, using steam, instead of chemicals. Sanitary cleanliness will be delivered by heating the freezer to 121°C and holding that temperature for 12 minutes. No chemicals and minimal labour.

The conveyor on which the produce passes through the freezer, is a type of shaker conveyor with a perforated bed, through which the fluidising bed, air, passes, ensuring the production of high quality, individually frozen pieces of produce. Specially designed fluidising air circulation fans deliver significantly reduced air circulation power consumption. In this case from 224kw, down to 85 kW.

The freezer is built in two halves to facilitate relocation. The freezer is built on a chassis on which the base insulation is laid. Usuallyfor other makes of IQF freezers, special foundations are required to prevent the freezer freezing the concrete under the freezer, causing the concrete to heave upwards and break up. By insulating the freezer from the concrete, it can be relocated to any location in the factory, without consideration of the concrete floor at any time in the future.

Specialised Produce Preparation

Sweetcorn

The sweetcorn cobs, once husked, are steam blanched to deactivate enzymes and to sterilise the cobs surface, using a steam blancher, like the ADCO steam blancher as per line 1. This processing sequence delivers Lockyer Valley Foods, significant improvements in whole kernel recovery of more than 20% and the reassignment of 83% third grade kernels being reassigned to first grade, whencompared with existing industry practices. After blanching, the sweet corn kernels are cut from the sweet corn cobs, on one of these 18 industry standard machines in two rows of 9.

Fig 8. 18 Corn Kernel Cutters.

Next the kernels are air dried, and the fines separated from whole kernels using air filters to ensure high quality cleaned kernels. Whole kernels are conveyed via tube conveyor to the chiller, installed before the IQF freezer, which lowers the kernel temperature to below 5°C. After the chiller, the sweet corn kernels are passed through an optical scanner, which inspects over 2 million kernels perminute and rejects foreign objects and imperfect kernels. Imperfect kernels are reprocessed into other corn by-products.

Broccoli & Cauliflower

Fig 9. The above photo shows factory testing of a double row floretting machine with manual loading.

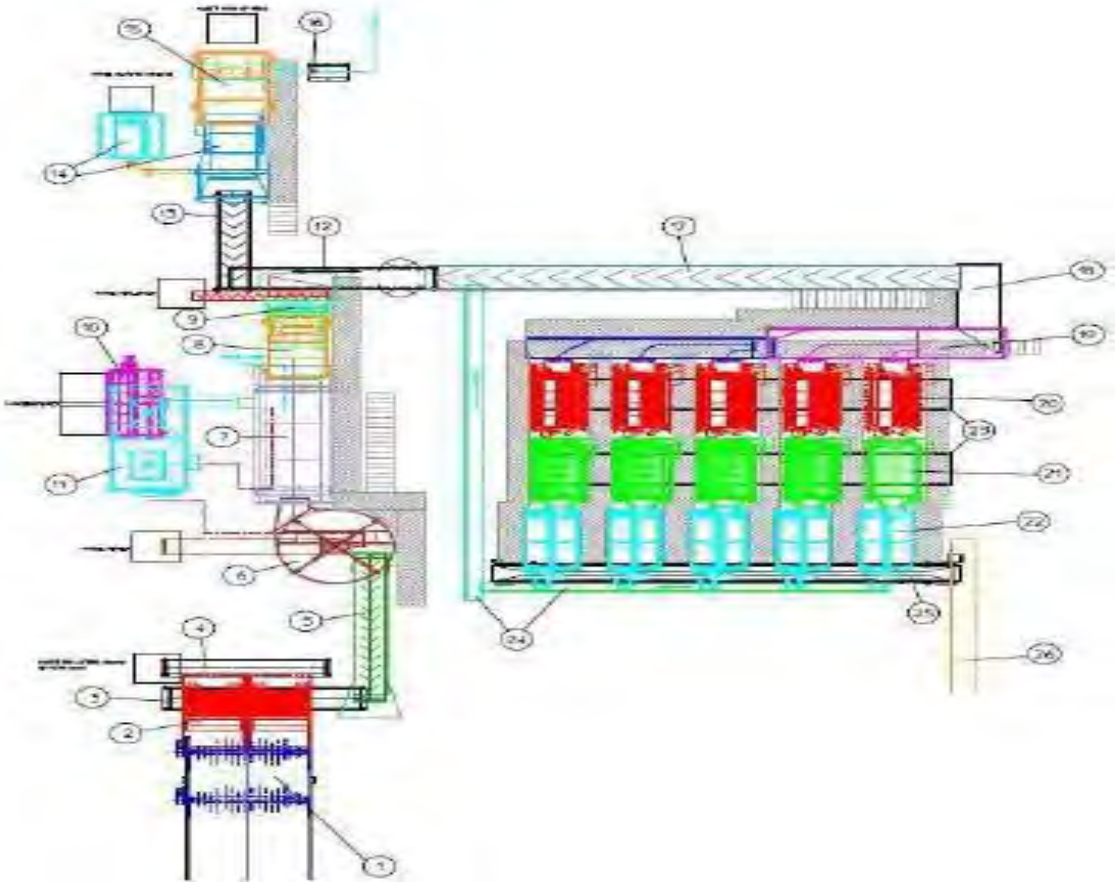
Lockyer Valley Foods are planning for conveyor and robot loading of the floret cutting cups at 90 heads of cauliflower per minute. Bin dumpers, to receive all produce arriving from the growers in field bins, are located at Receivals 1 and at Receivals 3, to provide maximum receivals options.

Broccoli and Cauliflowers are discharged from the field bins into an air agitated sanitizing tank for enough time to remove dust and sanitize the produce to a log 5 pathogen destruction, using Unipolar water.

This is an electrical process which does not leave a carcinogenic residue on the produce as is the case when using calcium chloride. Calcium chloride is the sanitizing chemical currently in common use. Air knives remove excess water while the produce is conveyed to a 6-conveyor distribution system which delivers produce to the 6 floretting machines which remove the cores from broccoli and cauliflowers.

Once cut the florets are conveyed to the common steam blancher, to neutralise the enzymes. After the blancher, the florets are conveyed to the chiller which cools the florets to below 5°C. After the chiller, the florets are passed through an optical sorter which will eject foreign objects and diseased or “off specification produce”. - Once chilled they enter the IQF freezer.

Pea & Bean line (15 tph garden peas and 6,5 tph round green Stanley beans)



The Line Consists of The Following Items

1. Bulk Feeders
2. Two Shakers Double Function
3. Conveyor Belt Good Product
4. Conveyor Belt Waste Product
5. Elevator Belt
6. Cyclone Destoner
7. Drum Washer
8. Dewatering and Spreading Shaker
9. Air Cleaner with Waste Evacuation Auger
10. Filter Drum Washer
11. Double Decantation Water Tank with Pump
12. Bidirectional Conveyor Belt
13. Belt Elevator
14. Separator Removing Floating Parts of Peas with Filter Drum
15. Shaker for Separating Small Pea Pods
16. Flume and Pump for Hydraulic Transport of Peas to Blancher
17. Belt Elevator
18. Spreading Shaker
19. Dividing Shaker for Beans
20. Declustering Drums for Bean
21. De snipper Drums for Beans
22. Un snipped Beans Remover
23. Waste Belt Collector
24. Un snipped Beans Return Cycle
25. Good Beans Collecting Belt
26. Conveyor Belt to Blancher

Peas & Beans

Peas and beans will be conveyed along their own dedicated conveyor, originating from the below ground receival bunkers at Receivals station two and travelling in the under croft, below the main processing room before being elevated to the processing room level. (The previous page is a drawing of the peas and beans layout. The peas and beans will now enter on the green-coloured elevating belt number 5on the following drawing. Sections 1 to 4 being in the sweet corn below ground receivals bunker).

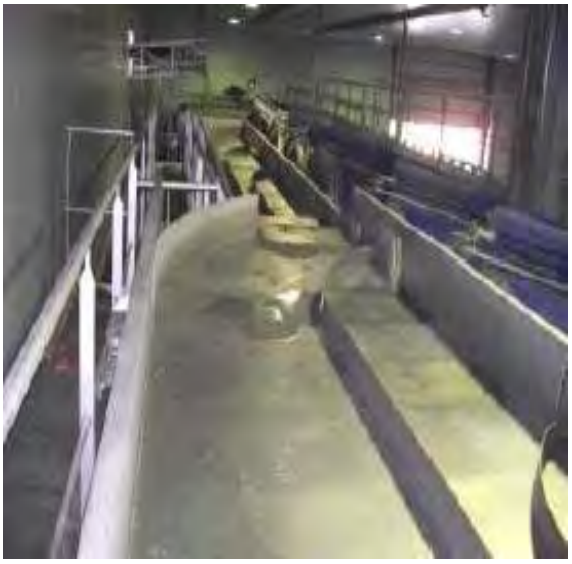
Air cleaner Type 1500

- Manufactured entirely from 304L Stainless Steel. Glass Infeed Opening 1500 mm.
- Feeding by Dewatering Shaker on S.S. Springs and 2 Vimarc Unbalanced Motors ShakerPan equipped with Dewatering Grids
- Radial Fan in S.S Casing. 11 kw 950RPM
- Decompression Cage Made of SS 1.5 mm plate. Observer and Access Ports on Both Sides Falling Screen3mm Opening. Removeable
- 200 mm Auger to Remove Floating Debris
- Overall dimensions 4200mm High x 2000mm wide x 3000mm Deep Stainless Steel Covered Galvanised Steel Silencer

This is a copy of the peas and green beans line proposed for Simplot some years ago, kindly forwarded to Lockyer Valley Foods by them.In the proponent's case it will be necessary to increase the bean snipping capacity to 10 tonnes per hour up from the Simplot capacity of 6.5 tph, by adding another 3 snipper reals.

Dividing & Feeding Shakers Beans

- Stainless Steel 304L Glass blasted.
- Dimensions 1P 6000mm x 1000mm +6000mm x 600mm
- The Shaker is Supported on a tubular Frame, Columns Filled with concrete.
- 200 mm Steps in The Grading Conveyors At each discharge Port
- Each Port feeds The Snipper Drums
- The Shaker Is Supported on Stainless Steel springs.
- Two Unbalanced Vimarc motors
- Manual Isolation of Each Discharge Port



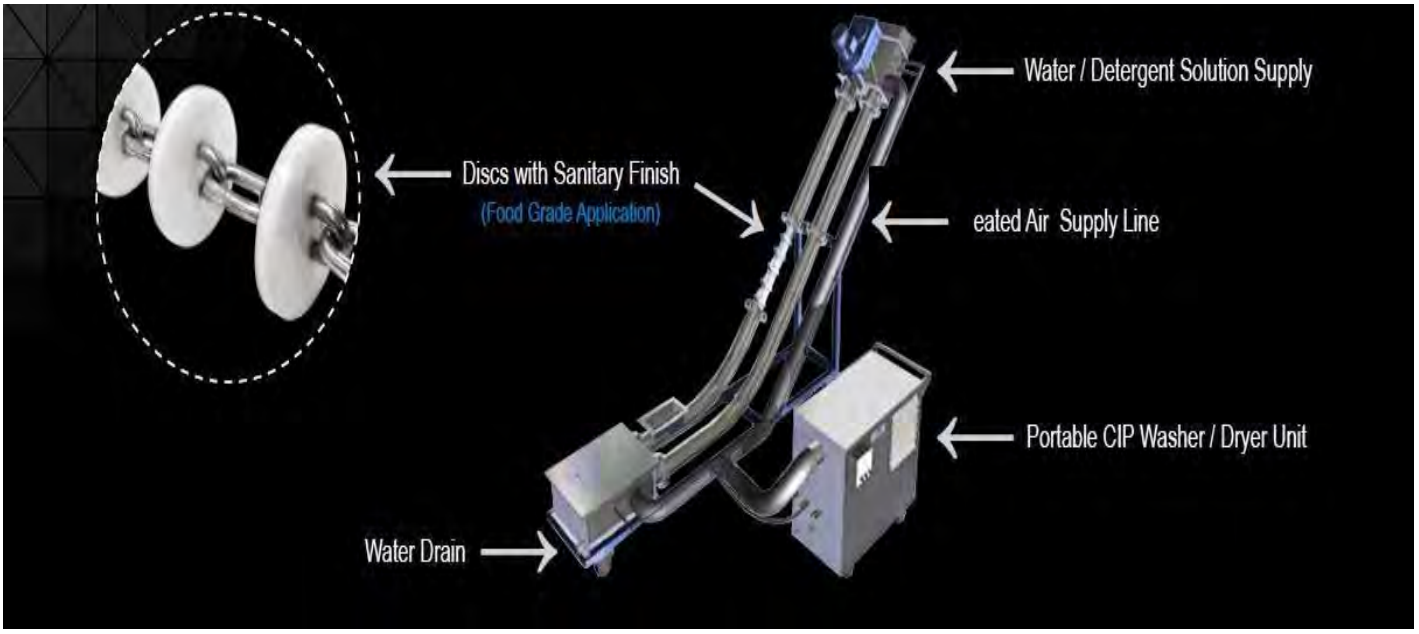
Once the peas have been washed, graded, and dried, they will be conveyed by tube conveyor to the steam blancher. As will the green beans after being washed, snipped, and graded and dried before being conveyed by tube conveyor to the steam blancher. After the steam blancher, they will proceed through the chiller, be chilled from 80°C to 5°C, then through the optical scanner, to remove foreign objects and to eject any imperfect peas or beans. Rejects going to a by- product processing line.

After the IQF Deep Freezer

The previous descriptions were for the various lines, for different species of produce, progressing through their specialised processes. All produce is directed to the steam blancher, which is common to all species, then through the aseptic chiller, optical scanner, theninto the IQF freezer. All species of produce have now been frozen in the IQF and will be conveyed into the deep freezer store.

Conveying to Deep Freezer Store

Deep frozen produce will leave the IQF freezer and be conveyed via tube conveyor across the top of 8 Multiheaded weighers and on into the deep freezer store, where single species produce will be discharged into 1200mm x 1200mm cubed storage bins. The conveyor tubes can transport at least 12,000kg per hour.



By passing the tube conveyor, directly above the 8 Multiheaded weighers, the operators can also bag frozen single species produceas it emerges from the IQF, without first entering the deep freezer store. From bagging they will go straight to cartoning.

Single species will be stored in storage bins within the deep freezer store until they are recalled for assembling into mixed multiple species, or single species frozen products, in single microwaveable bags, such as a mixture of peas, sweetcorn, broccoli and capsicum. Up to four storage bins at a time will be discharged from inside the deep freezer store, into four single species tube conveyors, which will convey the frozen produce onto one of the four segments of the weighing tables on top of each of the 8 Multiheaded weighers for combining into mixed species bags.

Tube conveyors have been selected for this application because they can be sanitised in a very short time with the employment of minimal labour. The installation is only 10% of the cost of a more complicated shaker conveyor installation and has a very elegant, uncomplicated route architecture, requiring considerably less floor space. Shaker conveyors and Z elevators require up to 6 hours and 3 operators to sanitise, when compared with the 30 minutes and one operator for the tube conveyors.

30,000 Pallet Automatic Freezer Store

Tube conveyors also enable IPT Pty Ltd, the deep freezer designers and manufacturers, to eliminate forklift access doors and forklifts in the freezer design. This eliminates the damage that forklifts cause to doors, door frames and the palletised produce, because theproduce is conveyed into the storage bins in the tube conveyors.

The lighting heat load is eliminated, as well as forklift engine heat, operator body heat and the loss of cold air every time an access door is opened. In this case for a 30,000-pallet storage facility the heat gain is only 66 kilowatts as compared with the normal heat gain of at least 450 kilowatts for a similar storage volume.

The deep freezer store consists of radio shuttle racking. Radio shuttles which are battery powered, wheeled rail runners, are positioned under the storage bins, where the radio shuttle lifts the bins and travels down the racking rails, to deliver the bins and place them 50 mm away from the previously deposited storage bin. The deep racking is 90 bins wide by 50 bins deep per isle and are 7 levels high for a storage capacity of 31,500 bins, which would contain about 28,000 tonnes of frozen product. The freezer store has been designed as close to a cube as possible to minimise the surface area exposed to heat gain.

As the produce will be packaged into retail bags containing up to four different species, not all species in the product mix will be grown at the same time. This circumstance requires the storage of a certain volume of produce from one season, to be held until the companion species have been grown, in the appropriate following seasons.

The six levels of storage described begin at the same level as the production floor. There is an additional level, in the under croft,below these 6 storage levels at the ground level. This grounds level stores pallets 2100 mm in height, containing packaged and cartoned products, stretch wrapped, ready for refrigerated transport.

This layout facilitates refrigerated transport operating from ground level, ensuring that refrigerated transport movements do not clash with produce and packaging transport movements in other areas of the plant. 4500 pallets of ready to ship products can be stored at this level.

Each storage bin has an RFID tag attached which contains all the data pertinent to that bin. The data is stored in the plants Manufacturing Execution System (MES), which keeps track of the progress of each grower's produce through the plant. To move the storage bins from the filling hoppers to the storage racking, transfer cars, able to carry 4 radio shuttles at a time, pick up the filled bins from the filling points within the deep freezer and deliver them to the deep isles in the racking system. As each storage bin enters the deep isles storage, an RFID tag at the entry of each isle, retrieves the data on the bins RFID tag and sends the data to the MES for archiving and inventory control.

The transfer cars are electrically powered using storage batteries. A battery recharging system on each transfer car will recharge the batteries installed on the radio shuttles, as they are being transported to and from the loading and unloading points.

By charging the shuttles on the transfer car it removes the necessity for an operator to remove and replace the heavy batteries to recharge them. Since the plant is operating at -18°C any opportunity to minimise staff having to operate in this environment dramatically improves plant efficiency. In fact, this whole approach, by eliminating forklifts and in freezer maintenance, has resultedin only ONE receivals operator being required in this huge deep freeze store.

Transfer cars requiring maintenance can be driven to an ambient temperature service bay attached as an extension, to the runningtracks in the deep freezer store. The transfer car has a duty cycle of 26 minutes, with only 6 minutes of actual movement, to load and discharge the four bins into the deep isles. This sedate duty cycle acts as a 20-minute buffer enabling technicians to remedy transfer car faults without affecting upstream processing.

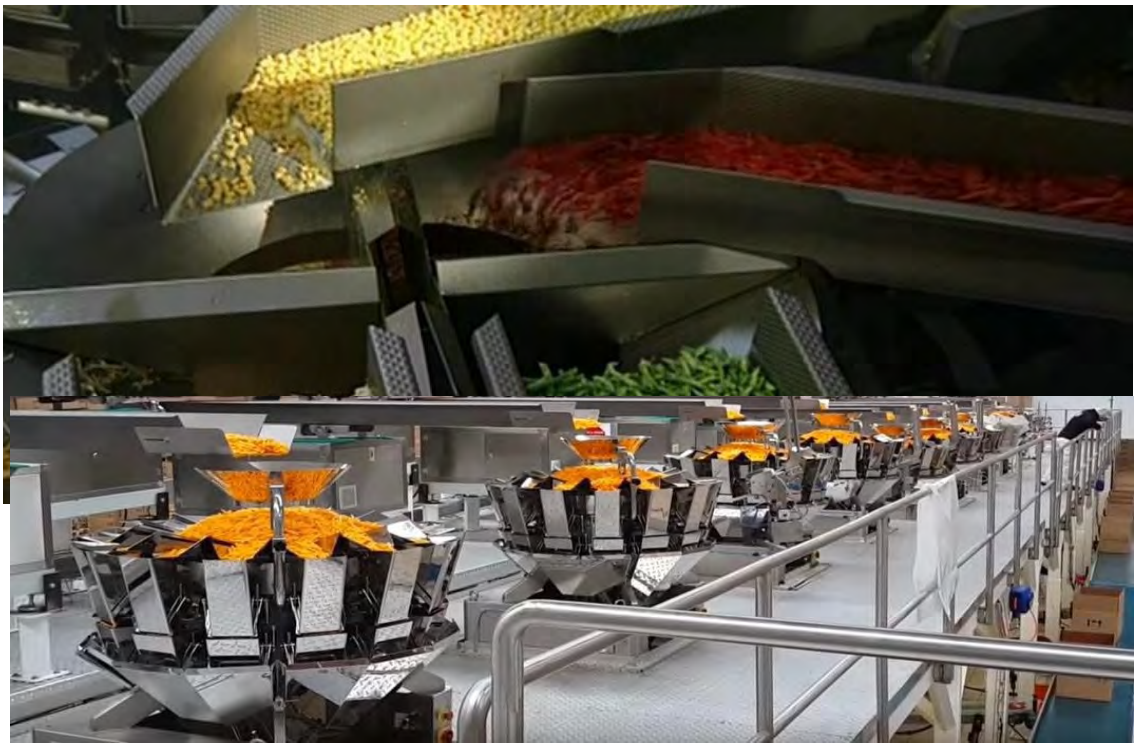
The deep freezer functions using a cascade refrigeration system which involves a standard ammonia refrigeration plant, operating a super critical CO_2 heat exchanger, to maintain the conditions in the freezer. This system is a low volume ammonia system, which eliminates fire risk in the freezer store and the IQF area and confines the fire risk to the ammonia plant room where it is more easily controlled. CO_2 being non-flammable presents no fire risks to any of the freezer equipment outside of the ammonia powered freezer engine room. Ammonia and CO_2 are an inexpensive highly efficient combination of refrigerants, which comply with the laws governing the use of CFC in refrigeration. When used in combination they embrace the best features of both refrigerants.

Retrieval from the Deep Freezer Store for Further Processing

As previously mentioned, containers of single species of produce are stored in the deep freeze store, until the companion products have been harvested and processed. Once the volume of produce destined to be packaged into mixed species is present in the deep freezer store, the desired mix will be retrieved and discharged into one of four discharge hoppers, each containing a single species,which will go into the mix. The individual species will be conveyed out of the freezer store and across the top of six Multiheaded weighers each configured to receive four different species and blend them into individual packages.

The following illustration is for the conventional shaker tray installation, this is a very expensive solution. In this case the quotation for 4 Multiheaded weighers and all the blending and dumping hoppers amounted to more than $6 million. The proponent's proposalis in the order of $1 million, with much more flexibility and a fraction of the cleaning time and cleaning costs.

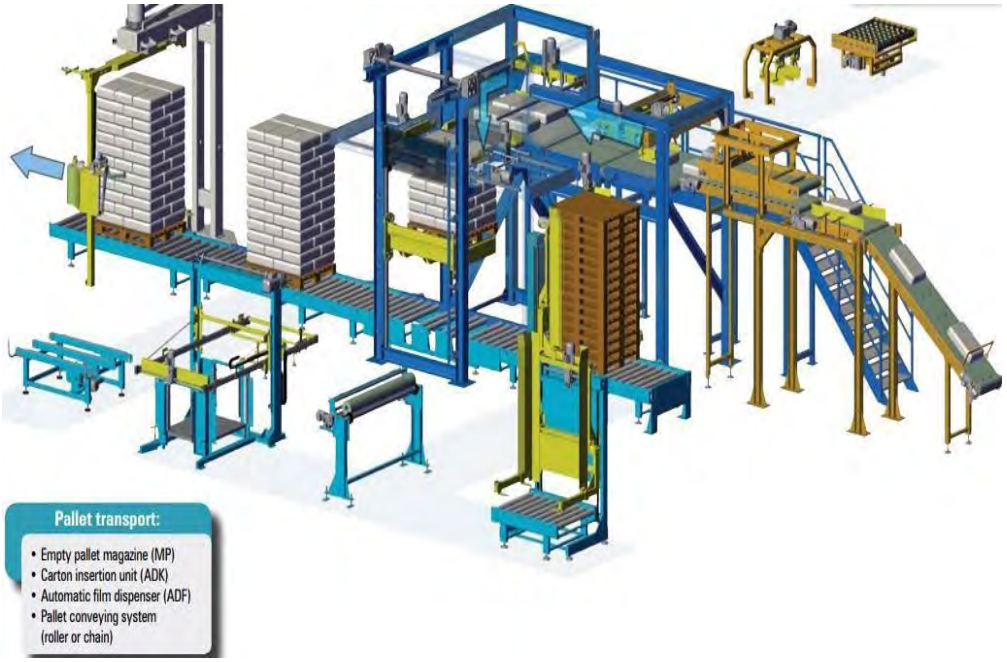
There will be 8 multi head weighers above 8 vertical baggers installed as a bank of six.



The above illustration is for six, single species multi head weighers, in the proponent's case there are 4 tube conveyors travelling above all eight of the Multiheaded weighers which precisely delivers the four ingredients to each Multi head weigher for blending into single microwaveable bags.

The 4 species, blended deep frozen produce mix, drops down into a vertical, form, fill and seal bagger, located below the platform, bagging at 90 bags per minute each. 6 conveyors convey bags from the vertical form, fill and seal vertical baggers to flow wrappers, for consolidation into larger bags. The Multiheaded weighers will be in an aseptic area where access is through air locks and the airis filtered to 0.3 microns through HEPA filters.

These individual packages can be microwaveable or for freezer storage only. Metal detectors and check weighers will ensure the weight and safety of each pack. Additional packaging flow wrapping machinery will assemble smaller packages into larger retail packets if required. This installation is common across many food processing industries.



These palletisers can form pallets up to 2700 mm high, to suit specialised transport solutions. After the palletisers, the pallets are shrink-wrapped. Lockyer Valley Foods plan to sleeve wrap the pallets, which use less plastic, which is easier to remove from around the pallets and the cartons are more easily identified through the smooth clearer wrapping surface, especially if the products are sold straight from the pallets to customers.

From the sleeve wrapper the pallet is conveyed to a continuously moving small, four pallet capacity blast chillers to quickly remove the heat gained during the time taken, bagging, cartoning and palletising. This ensures an efficient re freezing process, before the pallets are assembled by the transfer car, for delivery into the larger, deep freeze pallet storage area, where the refreezing would take much longer and place a greater load on the deep freezer store.

This refreezing, pallet collection and transfer occupies the bottom level of the seven-level deep freezer store. RFID tags are attached to each pallet to advise the MES system, once it enters the deep isle storage racks in the deep freezer palletised store, where the pallet is in the store and all other relevant data required to trace the produce on the pallet and its origins in the field through its progress through the plant and into the deep freezer store.

Refrigerated Transport Loading System

Pallets to be transported away are located and retrieved using the RFID tags via the MES system. The pallets being prepared for transport from the deep freezer pallet store are retrieved by common radio shuttles, operating from the dispatch side of the deep freeze pallet store. They are loaded onto a four-pallet transfer car and moved to the pallet load assembly system. Here the pallets are deposited on a roll case in pairs and moved forward to the load plate. When ready the pair of pallets are moved onto the load plateuntil they are up to 10 rows deep. The load plates can load a 40-foot container in 5 minutes using only one operator.

In this system the pallets are retrieved from the lowest level of the deep freezer store and assembled on one of the illustrated load plates shown. A key feature of this approach is that the retrievals from the store and the loading of the load plate are achieved without the use of forklifts and require only one operator in this area.

There are several benefits, chief among them is the elimination of forklift drivers and the ongoing problems with frequent staff turnover because of the -18°C operating conditions. Also, the elimination of damage to the pallets by forklifts and the elimination of heat gain generated by operators and forklift motors operating within the freezer store. As well as the heat gains and loss of chilled air associated with the usual opening and closing of freezer doors to move frozen product in and out. Also entering air is moisture laden which forms ice in the freezer requiring expensive ice removal operations to take place periodically.

When the load plate is filled, a refrigerated transport vehicle is backed up to the loading dock door. Laser sensors mounted outside the store locate the side of the transporter and transmits the coordinates to the powered load plate assembly inside the deep freezer store, the load plate carriage realigns itself with the alignment of the transporter, ensuring that the load plate has an unimpeded transit into the transport container. An outside cuff is secured to the transport container and the freezer door surround, to prevent warm moist air entering the deep freezer store. The cuff space is purged with dry air or nitrogen, then the deep freezer door is opened. The load plate is driven forward by a winch under the load plate until the load plate has travelled as far into the container as possible. The yellow gates, in the illustration, close behind the pallets and a hydraulic ram moves the pallets forward into the container to their final position.

The load plate is then withdrawn from under the pallets by the winch, leaving the pallets behind in the container. Thedeep freezer door is closed, the cuff removed, and the container door is closed. This is all accomplished within 5 minutes by one operator only.

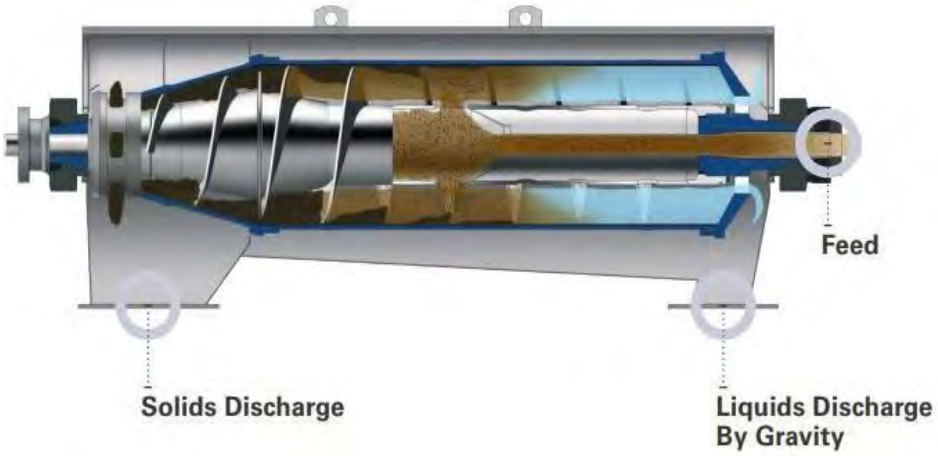
Bio Waste & Wastewater Treatment

The driving principle in the treatment of bio waste and wastewater is to minimise producing the volume of both in the first place. Vast volumes of water are wasted by the overuse of water in the produce washing and equipment cleaning process, which requires a larger treatment plant to process the higher volumes of wastewater. With this project, Lockyer Valley Foods has adopted multiple strategies to reduce water waste.

Lockyer Valley Foods plans to divide the types of cleaning and water use into several application categories. The first category is for water being used to wash field soils off the incoming produce. This water has its own cleaning circuit using mechanical collection and screens to remove sand, gravel, wood, and vegetable matter. The remaining water and its suspended solids once reaching a certainopacity is treated by using electro coagulation, which forms a colloid of aluminum, which settles out into conical based settlement tanks.

Twin Train Electrocoagulation

Vacuum Clarifier



The clear treated water is drawn off from the top and the precipitate dewatered through a centrifuge.

The precipitate, being mainly field soil, is returned to the farmland, while the cleaned water is recycled to the produce washing circuit. In this circuit, sources of water can also be roof and ground water runoff and bore water. This water is first treated by electro coagulation, before duty as sterilised, produce wash water.

The next significant waste of water is in the cleaning of equipment, conveyors, piping, tubes, and floors. To minimise water use, Lockyer Valley Foods have selected tube conveyors to move most of their produce because they require minimal water, labour and do not require harsh chemicals.

For example, the volume of water contained in 40 meters of tube conveyor is only 300 litres. Unipolar water is used to sanitise the equipment without chemicals. There is also a minimum labour requirement, as tube conveyors are usually self- cleaning with no, or minimum labour involvement.

For tubes and pipes through which pastes, and juices are pumped, Lockyer Valley Foods will be installing a Thermal Energy System (TES), which is a store of 200 tonnes of ice slurry at -5°C. Instead of 4 to 5 thousand litres of rinsing water being used to clean pipes and tubes of pastes and juices Lockyer Valley Foods will employ an “ice pig” consisting of less than 50 litres of water in the form of an ice slurry slug, or “pig”, to scour the inside of the pipes. Compressed air fires the “ice pig” around the pipework pushing the pastes and juicesahead of it.

This process takes less than a minute and recovers all the valuable paste product ahead of the pig, instead of being mixed with the cleaning water and increasing the water treatment volume. The ice slurry conforms to the internal architecture of pipes and line devices ensuring thorough scouring of the pipework internals.

Vegetable processing equipment is characterised by spillages and overflows of produce, all around the installation, requiring cleaning up at the end of a process run. Lockyer Valley Foods are redesigning the equipment in all their lines, to minimise the loss of produce by preventing it from falling from the process during production. Also, there are no bins and forklifts in the processing room, these usually spill produce and forklifts run over it creating clean up issues, all of which wastes water and chemicals.

The floor drains will be controlled using actuated valves so that wash water containing vegetable matter can.
be sent to the methane production tanks. When washing is complete Unipolar water can be retained in the floor drainage system, by closing the valves and the Unipolar water kept in place for the prescribed sterilising time. When sterilisation retention time has been completed, the Unipolar water will be transferred to the Unipolar water storage for reuse and to prevent the sterilising water being transferred to the methane process and killing the methane producing bacteria.

The chemicals generated electronically, in Unipolar water, mostly ozone and hydrogen peroxide, naturally return to the normal treated, scheme water state, after about one hour, leaving no carcinogenic residues in the water or on treated surfaces. The Unipolar water can be continuously recycled and re electrolysed to the standard operating level. The sterilising effectiveness of the Unipolar water is continuously monitored and re electrolysed as required, to match the process set point for hydrogen per oxide and ozone production.

All produce coming into the processor is treated using Unipolar water after washing and scrubbing to ensure that pathogens do notenter the manufacturing process on improperly sterilised produce. Bio-waste is collected from the biomass waste collection tube conveyors which are in the under croft beneath the processing floor. Waste streams from the processing lines fall through chutes into the tube conveyors, without forklifts or labour being involved. To maintain a sanitary environment the waste tube conveyors are easily sanitised by using Unipolar water by using no or minimal labour.

The bio waste tube conveyors transfer the solid material to a hammer mill which macerates the waste produce into a coarse paste. Wastewater, macerated solids, and raw sewerage are transferred to an interim holding tank. From this tank the mixture is pumped to a Thermal Hydrolysing System designed and manufactured by IPT Pty Ltd where the vegetable biomass is treated with steam for thirty minutes.

At the end of the continuous heat treatment process the mixture has been sanitised. The vegetable cell is thermally hydrolysed which breaks down the cell walls resulting in three times more methane being produced in one third of the time with an equipment package one third of the size of the more usual processes. From the Thermal Hydrolyser the treated mixture is pumped to the first tanks in the methane manufacturing process.

The methane generating process takes several weeks and is a finely controlled process, involving monitoring tank temperature and Ph. values for optimal production conditions. At the end of the methane generation process a fine sterile sludge settles to the bottom of the methane production tank and is pumped to a dewatering centrifuge which removes the sludge as an almost dry paste, whichcan be returned for spreading on the farms or value added into specialised fertilisers. The filtered water will be further treated depending on the purity required in the next process in which it will be used. For example,washing incoming produce, boiler water and drinking water, which will each require increasing levels of purity.

Canning Line Opportunities Stage 2/3

Lockyer Valley Foods has been pursuing the opportunity to process the locally grown produce into cans and other modern packaging options such as pouches and modified atmosphere trays. This option is particularly attractive to Lockyer Valley Foods and Southeast Queensland growers because it offers the growers another market option to the current fresh markets. This approach by Lockyer Valley Foods offers a valuable market for over production in bumper crop years and for sound quality produce which lacks perfect visual appearance required by the fresh markets. Volumes of this type of product can be above 50% of the crop and is usually left to rot in the paddocks.

Lockyer Valley Foods plan to install at least two state-of- the-art can body making lines, to produce their own metal containers very economically and supply metal cans to other Queensland industries who require locally sourced metal cans. This enables the canning process to be significantly more economical than buying the cans in from metal can suppliers. This approach allows Lockyer Valley Foodsto pay more for the fresh produce and share the economic benefit with farmers so that all participants in the supply chain can maintain profitable enterprises and ensure regular supply.

Lockyer Valley Foods has developed many innovations not currently employed in the food processing industries. These innovations have enabled the products manufactured at the fruit and vegetable processing facility to be price competitive with world manufacturers and imported products. This is particularly relevant in the current very strong demand from customers and retailers to replace current imported. Many of these imported products have been found to have been grown and processed unsafely and involve significant food substitution frauds.

The can making lines and the canning and developing preserving technologies can be implemented as a staged investment withoutaffecting the initial planning which is planned to begin with the freezing lines. Equally the canning lines can be installed at the sametime as the freezing lines. The CAPEX for the installation of this additional section involves expenditure on the following: a 15-bay extension of the main processing building, to accommodate can storage, autoclaves, packaging, and palletising.

Additional innovative storage solutions for beetroot and tomatoes and can filling and pasteurising equipment lines. A stand alone can body making building, mezzanine can storage, with innovative can retrieval and conveyance to the can filling lines. Additional energy systems have also been included as have extended hard stand and staff car parks. The total additional expenditure for this additional section is $45 million.

Powder Line Opportunities Stage 2/3

Lockyer Valley Foods plans to install six microwave assisted vacuum drying systems to convert around 150,000 tonnes of fresh produce although sound they are not visually acceptable for fresh retail produce for converting into high value powders. The installation will be in building four, for ease of integration with grading and preparing produce destined for the freezing line.

The produce destined for powder will be subjected to PEF technology (Pulsed Electric Field) which is purported to increase juice yield by 6%, from the produce pulp destined for powder and carbonated fresh fruit drinks.

The juice is converted to a paste with a moisture content of 30% in a triple effect falling film evaporator fitted with Mechanical Vapour Recompression technology which minimises the consumption of steam in the evaporation process by recompressing the steam to its original temperature and pressure. This a technology highly suited to the very low cost of electricity production on site from bio waste.

At this stage Lockyer Valley Foods plan to offer the powders in bulk to remanufacturers. At a future point it is anticipated that the project will also engage in further opportunities for value-added powders.

The powder processing area will involve a capital expenditure of $35 million.

Plastic Pallets Line Opportunities Stage 2/3/4

Lockyer Valley Foods plan to install a plastic light weight pallet forming line to the south of the site for which will be connected to building 3 with a sky bridge. This sky bridge will convey the finished pallets to the palletising lines in building four. There are developing severe shortages of wooden pallets in the marketplace as the result of the recent forest fires. The pallet supply situation will continue to be a supply problem until new plantations are established and matured.

The pallets only weigh 8 kilograms and are Phyto sanitary, allowing them to be used around the world in retail situations where retailers can offer products for sale from the pallets. This facility is not permitted for timber pallets.

Lockyer Valley Foods intend to load their products onto the pallets for transport to the retailer's Distribution Centres, where once unloaded they will be on-sold to pallet distribution and hiring companies. The sale of these pallets is very lucrative, as well as offsetting pallet hire charges.

Metal Can Manufacturing Line Opportunities

Lockyer Valley Foods plans to expand the capacity of the metal can manufacturing line to offer metal cans to selected manufacturers to increase the scale and efficiency of their plant as well as generate a significant profit centre.

Bio Methane Plant Opportunity Stage 3/4

Lockyer Valley Foods has designed the plant to efficiently collect all the bio waste being generated from the plant. Also, they plan to accept specific bio waste from individual manufacturers and city councils. This waste is high in fats, oils and proteins which result in the production of higher volumes of bio methane per ton of waste when compared with digesting animal excrement. The planned tonnage is 190,000 tonnes of bio waste.

Innovative Process Technologies Pty Ltd will be offering a complete turnkey biomethane plant which is state of the art with many innovations to optimise the conversion of biowaste into high quality bio methane, carbon dioxide, slow-release fertiliser, and high value palletised fertiliser from the digested fraction of the waste stream.

The whole operation is designed to be dust and odour free.

The installation of the bio methane plant is vital in armour plating the facility against the coming unreliability of the national power grid by the adoption of patently unreliable technologies, we need to ensure there is a sensible power back-up technology available.

Apart from providing solid risk management facility, the plant off sets the purchase of around $23 million of natural gas from the grid when the tariff is $19 per gigajoule. The price is currently higher than this and will probably go higher once other misguided carbon taxes and levies are imposed. This is a perfect opportunity to contain energy costs.

The bio methane gas will be used to fire the steam boilers and six natural gas engines, operating electric generators, which

will provide reliable electric power to the plant. The cost to produce electricity is around 6 cents per kilowatt hour, as opposed to the current tariff of over 35 cents and almost certainly going much higher once the real costs of solar and wind are charged.

Excess gas will also be generated to power six, 540 horsepower semitrailers. The cost to fuel the trucks to the port of Brisbane and back is estimated to be only $16. Natural gas-powered trucks have lower maintenance costs than diesel trucks.

It is proposed to install a limited number of solar panels to generate hydrogen gas during the day. It is intended to inject hydrogen into the bio reactors to increase the bio methane production by 17% while at the same time reducing the CO2 generated by 17%, from around 30% of the process.

The CO2 will be used in carbonated drinks and to manufacture dry ice which will be used to gently clean PET bottle molds and baked on food in the processing kettles, without the use of harsh chemicals.

The fertilisers will also be an additional profit centre as well as offsetting the cost of waste removal charges. The “green credentials” of this program will also be used to support the marketing narrative to highlight the many sustainable goals currently sought by the plant’s customers.

Tomato Processing Facility Opportunity Stage 3

Lockyer Valley Foods is planning to install an aseptic tomato processing line in building 5. The planned throughput is 250,000 tonnes per annum of Roma tomatoes. Work by our agronomists has been achieving astounding yields of up to 220 tonnes per hectare and we will share this knowledge exclusively with our suppliers. These tomatoes are being grown in only 86 days which is 14% faster than industry norms in Victoria. They are also far superior in flavour to Italian, Portuguese, and Turkish with a Brix number over 6.5 when compared with the European numbers od 4.8 to 5.1.

Analysis of the cost to produce Roma tomatoes in Europe, undertaken by Lockyer Valley Foods, suggests a delivered price of below AUD 150 per ton., Currently this cannot be matched in Queensland where they are around AUD340 per ton. Analysis by Lockyer Valley Foods reveals the point of difference being nurseries in Queensland are charging 25 cents per seedling. In Italy they are less than 10 cents. Lockyer Valley Foods have investigated high volume seedling propagation here and have deduced that they can grow a seedling for around 7 cents. Combined with modern planters with only one operator planting 176,000 seedlings per hour and 90 ton per hour harvesters with only two operators Lockyer Valley Foods can deliver Roma tomatoes to Withcott for less than AUD150 per ton. This ensures the international competitiveness of Lockyer Valley Foods Ltd tomato products.

Queensland is the ideal location to grow Roma Tomatoes because crops can be grown all year round. Two crops in Southeast Queensland in the warmer months and another crop in the Burdekin area (Bowen etc.) in winter, in contrast to Victoria where one crop per year only, is possible. This means for the same annual tonnage Lockyer Valley Foods processor is only one third the size of Victoria.

The Withcott plant has been designed to produce tomato paste, tomato powder and canned tomato chopped and whole tomatoes.

Combined with the inhouse economical cost of fabricating their own metal cans and the internationally competitive price to grow the tomatoes here, the manufactured price of Lockyer Valley Foods canned products places them in an unassailable position to produce products a price that importers cannot match. Lockyer Valley Foods are very excited about their tomato

products prospects by combining internationally competitive prices and flavour superior to Italian produced Roma Tomatoes.

French Fries Line Facility Opportunity Stage 4

Lockyer Valley Foods are planning to build a state-of-the-art French fry in building 6. The planned intake is for 150,000 tonnes per annum of fresh potatoes suitable for French Fries. This tonnage of fresh potatoes is calculated to produce about 100,000 tonnes of French fries and potato products manufactured from smaller pieces of potato, such as hash browns. To preserve the potatoes for year-round production Lockyer Valley Foods will build several, Subarizers off site in which to store fresh potato in perfect storage conditions. Working with the Cooperative and our Grower shareholders extensive research will be performed to determine the optimum potato varieties and genetic material to ensure a yield per hectare exceeds the current yields in Tasmania. Achieving this will place Lockyer Valley Foods cost to produce at less that Tasmania and New Zealand. Desktop studies with horticulturalists and geneticists believe that this is entirely possible.

Operation Description Completed All Stages

ROCHES ROAD PLANT DESCRIPTION

- ✓ The proposal is to process fruits and vegetables into several wholesale products.
- ✓ The produce will be sourced from Southeast Queensland.
- ✓ Products to be processed include frozen, fresh in modified atmosphere packaging, powders and fruits and vegetables in plastic and metal containers.
- ✓ The containers will be manufactured on site. Light weight air portable pallets will also be manufactured on site.

GENERAL

- Manufacturing operations will take place 24/7 to facilitate the harvesting constraints of the weather and maturation of the produce. Truck movements will only occur between 6.00am and 9.00 pm Monday to Saturday and 7.00 am till 6.00 pm on Sundays. Trucks will have their undersides high pressure washed on entering and leaving the site. This will minimise the spread of pathogens between the farms and the processor to ensure Federal Government assistance in the event of a disease outbreak.

- All trucks will only proceed around the site in one direction, to eliminate reversing sirens disturbing the neighbours and safety for operators and visitors.

Building 1

This building manufactures metal cans and plastic containers. Can metal and plastic are also stored here.
The cans are transported via a sky bridge to Building 4 for storage and retrieval to the can and PET bottle filling lines located there.

Building 2 – Stage 1

This building is the site's plant room, containing 6 x 1.0 MW and 3 x 300 KW gas powered electricity generators and 3 x 300 KW diesel powered electricity generators for emergency power supply. All waste heat is collected from the generators to generate processing steam. The plant room also contains 2 x 8.0 MW steam boilers to generate process steam.
This building also houses the plant maintenance workshops.

Building 3

This building houses a plastic pallet processing line. The pallets are transported via a sky bridge to Building 4 on which packaged goods are palletised before dispatch.

Building 4 – Stage 1

This building is 3 Levels high and contains the main equipment for processing a wide range of produce grown in Southeast Queensland.
The top level contains the administration suite and the canteen as well as training rooms, electronics workshop. There are also facilities to receive tourists, students, and farmers to showcase the Food and food production. A large terrace is also on this floor for staff and visitors to enjoy views out over the Lockyer Valley.

Towards the southern end of Building 4 at this top level there is a large sterile storage space in which to store and automatically convey metal cans and plastic containers to the processing floor below.
The next level down is the main processing floor which receives different categories of produce at various entry points specific to the produce being processed. This level is at ground level, along the western aspect of the building, to facilitate ease of produce supply. Root vegetables, berries and mangoes will be received on the northwestern corner of this building.

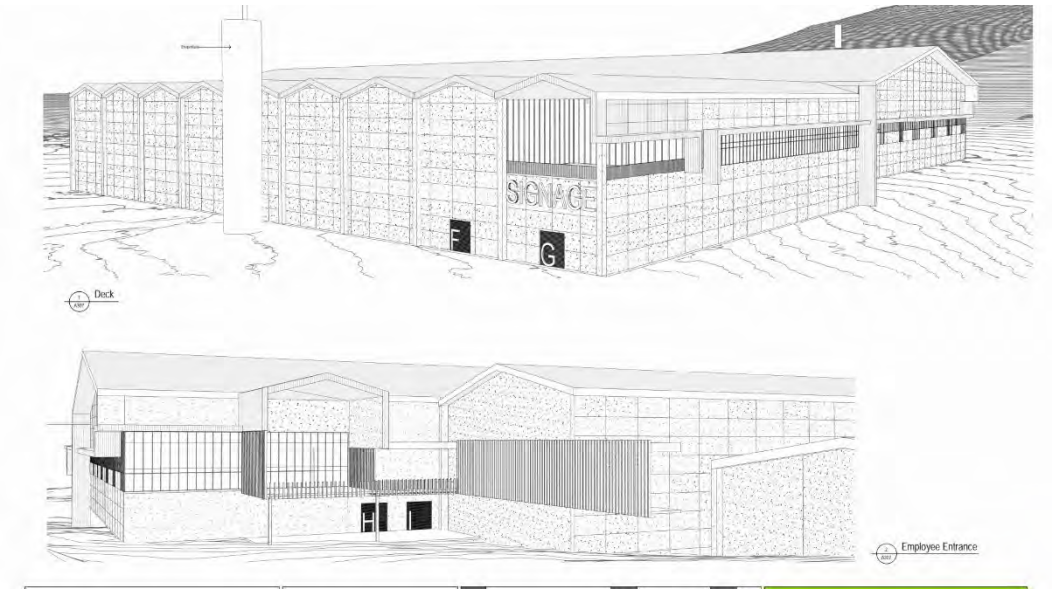
External to Building 4, also on the northwest corner, silos containing navy beans, chickpea and flour for pasta making, are located for ease of retrieval to the canning lines. Further to the south along this wall the site laboratories and brining and syruping rooms will be located. Further south along this western wall the cardboard box store and cardboard box and label printing area will be located.

On the northern end of Building 4, sweetcorn, peas, beans, broccoli, cauliflower, avocado and mushrooms will be received. These products will be processed and deep frozen by 2 x IQF freezers and stored in the 32,000-pallet capacity -20C, deep freezer store which is prominent on the eastern elevation of Building 4. Dispatch from this freezer area is also from this eastern aspect.

Underneath the office suites on this middle floor there is located a fruit and vegetable powder processing facility capable of converting 150,000 tonnes per annum of produce normally unsaleable and left to rot in the paddocks into high value powders.

The evaporated water from the powder making process is condensed and used for processing water. The water is evaporated from the fruit and vegetable juices by large falling film evaporators and a very tall (32 meter) Mechanical Vapour Recompression unit located in front of the Deep Freezer Store on the Roches Road elevation. About 127,000 tonnes of pure condensed water are produced from this process and will be used for process water.
Within Building 4, along the internal western wall the metal can processing, MAP packaging and juice filling.
Lines are located. Once filled the metal cans are transferred to a row of autoclaves for sterilising, from which on completion, they are labelled, cartoned and palletised. A metal can store containing 14 million cans occupies the next area in Building 4 to the south of the autoclaves. Automatic pallet retrievals and truck loading occupies the balance of the building heading south.

Beneath the main processing floor are located the buildings services such as steam, compressed air, motor control centres and waste removal conveyors. Also, in this space there is a large laundry to wash uniforms, sewing room and uniform store. Also, the staff facilities are also located here, as well as fireproof escape corridors. The service corridors are also used to facilitate the movement of maintenance staff and the transfer of packaging materials. This level is located at ground level to facilitate the lifting of heavy items of plant and equipment and ease of access to the services located here.



Building 5

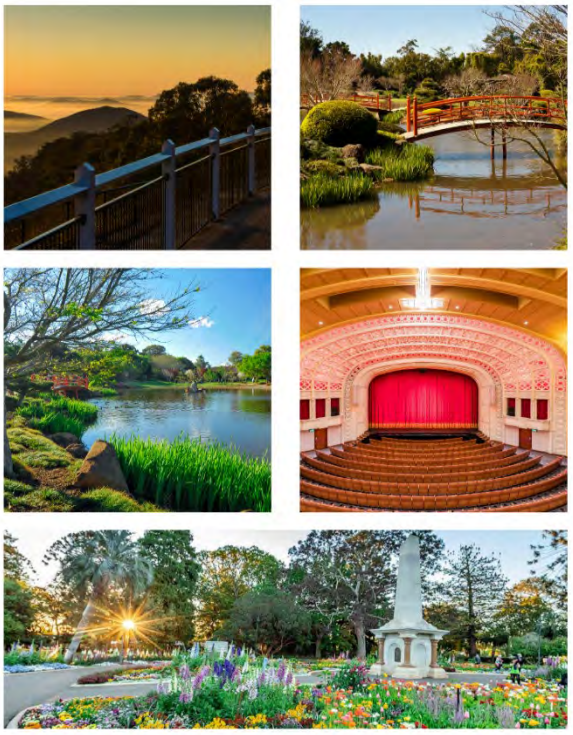
This building and Building 6 are accessed by their own shared entry road which exits the main entry road. This approach reduces the freight movement around the overall site by 400,000 tonnes of incoming freight per year. Tomato processing building here 250,000 tonnes of tomatoes are received at the rate of 90 tonnes per hour. The tomatoes are converted into tomato pieces and paste. The tomato pieces are pumped to building 4. for canning. Tomato paste is pumped to the ground floor of Building 5 for packaging as required. The tomato juice is converted to paste by a large falling film evaporators and a Mechanical Vapour Recompression (MVR) tower located externally on the western side of the building. Around 150,000 tonnes of pure condensed water are produced in this process. This MVR unit is 32 meters tall. Some of the paste is pumped to the powder making line in Building 4.

Building 6

This building is to process 150,000 tonnes per annum of fresh potato into French Fries and other potato products and will operate 24/7 all year round. The potato products will be frozen, packaged and palletised for dispatch from the eastern aspect of the building facing Roches Road.

Lifestyle Considerations

The Withcott site is within minutes of a major shopping precinct in Toowoomba which is Australia's largest inland city with comprehensive shopping, medical, recreational, and educational facilities. These are essential elements required to attract and keep a skilled workforce in a highly competitive market. The major competition is the mining industry which is attracting many skilled local people away from Lockyer Valley enterprises.



Expenses OPEX

Operating expenses have been generated using models beginning with a single shift for the first year, rising to two shifts by year two and three shifts by year three. During the first three years an additional 20% was added to the labour staffing numbers to reflect the numbers of personnel and their training period required to reach operational proficiency. The 20% remains with the extended labour numbers to reflect the contingent costs of staff turnover emerging in Australia. Lockyer Valley Foods recognise the importance of retaining staff and has active plans for staff retention and the development of an onsite culture Sales figures are based on the retail prices from the online sites of major grocery retailers. The usual wholesale price for suppliers is derived by subtracting 22% plus another 30% of retail, or a combined 52% of the retail price. The 22% being the levy imposed by the retailers for advertising and promotions. In this case Lockyer Valley Foods have used retail less 22% and retail less 40.5% as the basis of their modelling. The items referring to advertising and promotions are in addition to the 62.5% discount in the models.

Our commitment to growers and our virtue signaling model about community involvement encourages us to engage (with the Cooperative) in research and development mainly revolve around agricultural field trials in the early years and will only involve two to three hundred thousand dollars. R&D for the manufacturing components are an additional contingent item, as in reality there will be very little required for R&D in a mature segment such as frozen fresh produce. There will be some allocation to R&D for value adding to by- products for manufacture soon. No sales analysis has been included for the significant potential for the sale of value-added products manufactured from these by-products in the future.

The cost of electricity has been derived from the state reticulated methane gas grid, based on a gas tariff of $52 per gigajoule. If waste oil was used to generate process steam the savings for full production would be $2.2 million per annum. When diesel fuel is used to generate on-site electricity the cost of electricity is comparable to electricity generated from gas-powered engines. Gas produced from bio waste has not been taken into consideration in the potential to reduce energy costs.

Lockyer Valley Foods have chosen to leave the cost saving out of the models to act as a further contingent item. Main's electricity will not be used as the main source of electricity, so has not been used in the modelling. Lockyer Valley Foods has deliberately avoided the use of mains power because of the potential for significant power disruption to the grid, caused by the introduction of renewable power sources to the grid.

These disruptions are already being experienced in Victoria, South Australia, and New South Wales. The forced adoption of electric vehicles will only add to the potential disruptions to power supplies, power outages caused by peak loads because of mass consumers recharging their vehicles at the same time. Considering that Lockyer Valley Foods has 28,000 tonnes of frozen product in storage, a reliable power supply is vital to maintaining it in a frozen state.

The data highlights the enterprise efficiencies, where the labour costs have been deliberately inflated by the addition of contingent staff members and staff benefits and are still below 15% of the cost of production, energy consumption is around 2.4% of the cost of production and interest costs reduce from 13.0% in year one, to only 0.79% in year four. The financial benefits gained from the introduction of three shifts and, enable borrowings to be paid down by year four.

The modelling emphasizes the importance of controlling the cost of the produce being converted into frozen products, as it represents the largest proportion of the manufacturing costs of around 57%, monitoring these costs is a vital element in the success of this enterprise. To achieve this, Lockyer Valley Foods have been working closely with their horticultural consultants, to increase the yield of all their crops, to minimise work effort per hectare and to reduce water consumption. While many crops are being studied, here are several examples of their success.

The following references to a range of fruits and vegetables are designed to highlight the technical advances that the proponent's chief agronomist has achieved. Tomatoes and mangoes will be incorporated into future stages of development and are not partof stage one product mix.

Roma tomatoes have a worldwide industry standard of around 90 tonnes per hectare. Lockyer Valley Foods trial yields are 200 tonnes per hectare for Roma tomatoes and a reduced growing period from 100 days to 86 days which reduces water consumption and a yield of 350 tonnes per hectare for truss tomatoes.

Cauliflowers and broccoli up to 2.0 kilograms have been grown. The large size increases the piece count through the preparation machinery, when compared to the size of the usual retail cauliflowers and broccoli which are under 500 grams each. A bigger individual piece size means more tonnage with the same number of people and machinery. Peas and beans increased yields from 2500 kg per hectare to over 10,000 kg per hectare. These yields reduce the growing costs per hectare and make this proposed enterprise internationally competitive in cost. Capsicum weighing over 400 grams each, ideal for processing due to the increased yield of processed strips per piece. The following photographs are mango trees, remarkable by the prolific flower set and the healthy colour of the leaves of the tree. To get flower sets like this, farmers try to trick the plant into believing that it is going to die, so in a last-ditch effort to pass on its genetic material, it sets abundant flowers. However, the practice usually weakens the plant, which is manifest by a generally unhealthy plant, yellow leaves etc. and shedding flowers and results in the tree being unable to set and retain the fruit.

In this case the horticulturalist has found that he can achieve the same result by manipulating the plants nutrition levels by feeding more fertiliser elements containing cations (net positive electrical charge) than anions (net negative charge), while still maintaining general high plant nutrition. As soon as the flowers are set, he brings the cations back to the ideal level thus returning the plant to its healthy status, allowing the plant to retain all the flowers that it has set. The usual practice of weakening the plant means that it is not healthy enough to develop the flowers into fruit and usually the flowers and fruit are shed before maturity, maintaining only sufficient flowers to match the plant's ability to nurture the remaining fruit to maturity. The agronomist uses a Growth Calculator which gives him the trend for potential growth in the plant, utilising a complete suite of readings taken from sap analysis, to arrive at a single growth potential figure.

These watermelons weighed in at 25kg each, too big for retail, but ideal for processing. A particular feature of this fruit is the densely textured flesh, usually for fruit of this size the flesh is flowery and loose textured.

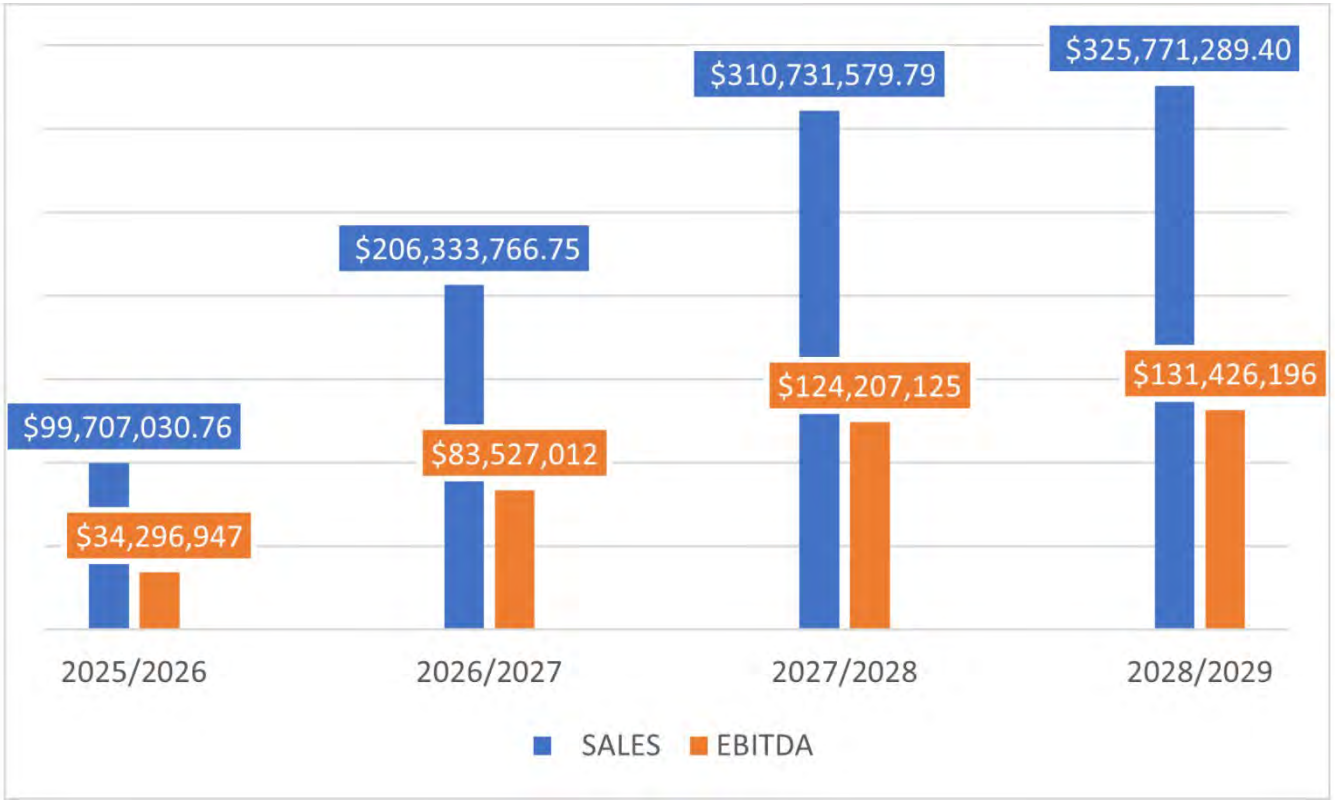
The proponent's business model is to involve themselves with the produce production cycle, by getting involved from the starting point of land selection, planting, harvesting and transport to the processor, for the mutual benefit of the growers and all other stakeholders. Lockyer Valley Foods believes that production and processing must be integrated for optimal benefit to all stakehold

EXPENDITURE MINIMAL PROJECT SCOPE DEEP FREEZING LINE ONLY – BUILDING 4 – PLANT ROOM BUILDING 2 & RELATED INFRASTRUCTURE

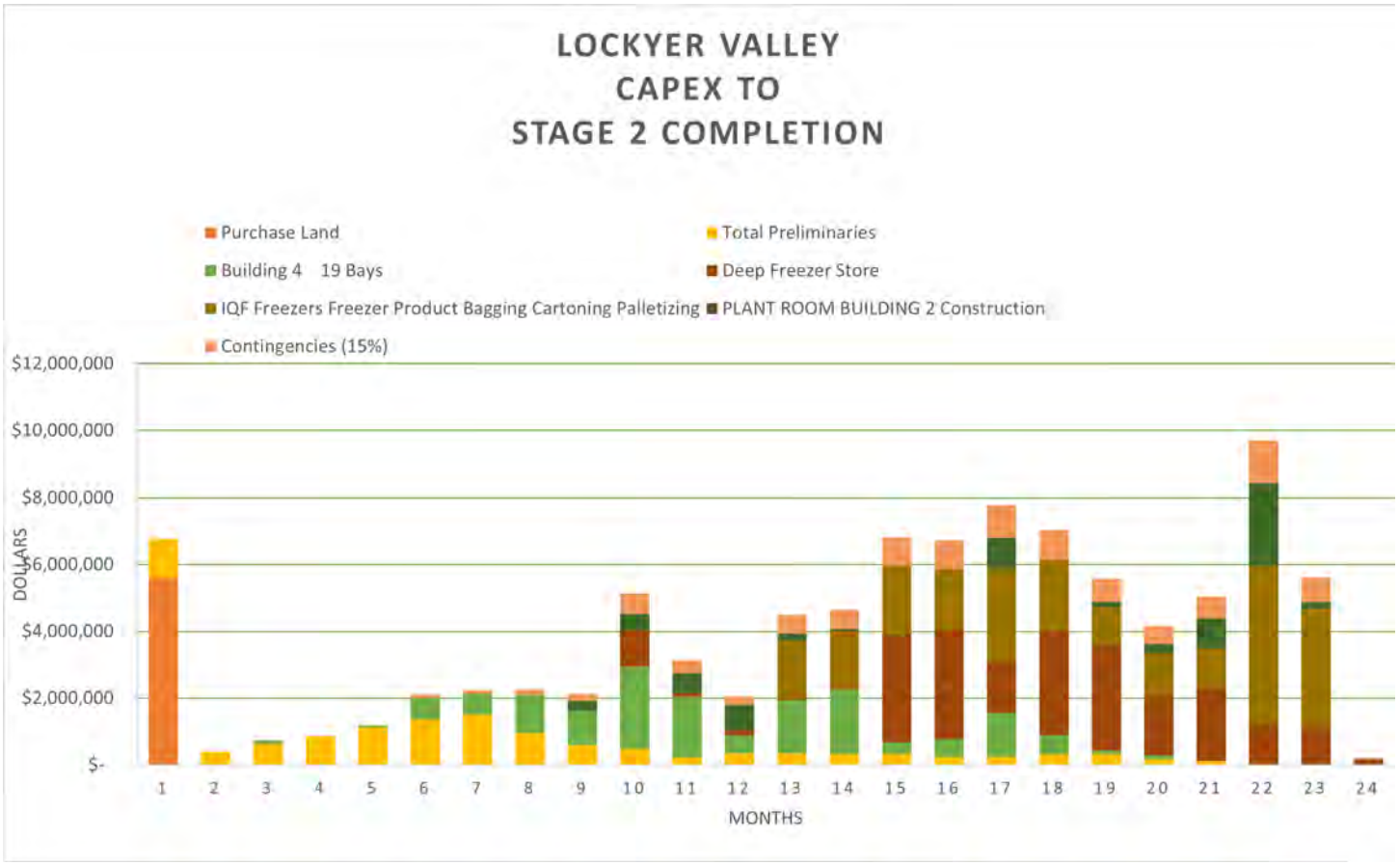
Ultimate Project Expenditure Over 5 Years $438,106,000

Land and Settlement Costs	$5,921,775
Administration until production	$3,330,000
Building Design and Engineering	$550,000
Building Approval Fees	$877,270
Other Preliminary Costs	$1,132,936
Earthworks	$5,206,560
Building 4	$17,205,969
Building 2	$6,344,857
Deep Freezer Store	$25,634,789
IQF Freezers, Bagging Cartoning Palletizing	$12,053,013
Produce Preparation and Receivals	$16,341,862
Plant Room Equipment Building 2	$2,296,983
Water Tratment Plant	$400,000
Weigh Bridge	$180,000
Staff Car Park	$183,013
Other Costs	$228,522
Includes 15% Contingency	
TOTAL CAPEX MINIMUM PROJECT SCOPE	$97,887,550

FROZEN LINE



Lockyer Valley Fruit & Vegetable Processing Company Limited
Capex to Stage 2 Completion



Assumptions

- The fresh produce is based on a delivered to the factory price.
- Reticulated gas from the grid has formed the basis of this summary at $52 per Gigajoule. The gas will be used to generate steam and electricity using stationary gas engines.
- Lockyer Valley Foods are planning to convert over 190,000 tonnes per year of biomass into methane to supplement the gas from the grid.
- Biomass conversion to gas and high value fertiliser will eliminate waste removal costs.
- Over 90% of water is recycled.
- The steam generators can also be fired on waste oil if disruption to the gas supply is experienced. Waste oil costs $22 per Gigajoule (Gas $52).
- Waste oil usage would save the enterprise $2.2 million per year.
- Electricity could also be generated using the backup diesel generators for around 15 cents per kilowatt hour, like electricity generated using gas, in the event of a gas supply disruption. Bulk diesel price of 90 cents per litre havebeen quoted to Lockyer Valley Foods.
- Packaging includes pallet hire.
- Year one involves one shift plus an additional 20% of staff in training. Year two, two shifts plus staff in training, risingto three shifts by year three.
- Current tonnages required by retailers indicates that production could be required to ramp to three shifts in less than three years.

- Nonlinear variations in the data are due to implications of seasonality on operational expenditure and where the produce arrives for processing in the analysis cycles.
- A sinking fund has been included to ensure adequate funds are available for engine and processing equipmentrebuilds and modernisation in the future.
- Contingencies have been built into the model based on individual line items as opposed to a % of the total sum.
- All costs and sales have been escalated annually by 4.5%
- It is suggested that a finance package involving interest only at 8% for a period to be agreed on, form the basis of the model. A balloon payment matching the ability of the enterprise to make has been included in the developed model.
- The architecture of the finance package will require adjustments if the enterprise is satisfied that stage two developments can be implemented.

Operational Works now under preparation

- ▪ Project design management
- ▪ Civil engineering
- ▪ Tender assistance
- Briefing Documents

Works planning is based on the following:

Discussions with the Company

- Lockyer Valley Regional Council (LVRC) Development Approval MC2022/0049, dated 15 December 2022
- Previous design scope of works
- RMA Engineers documents, reference C-SK001-C, C-E0201-B, C-E0401-B, C-E0601-A.
- Project Understanding.

Extent of Works:

This proposal includes the scope of works for the development of the ultimate site layout plan, preparation of the Early Works Civil Package scope of works and for the holistic Design.

Management of the Lockyer Valley Cannery project.

It is understood RMA Engineers will be supporting the Project Manager in managing the project, the consultant team, assisting with project timeline development, preparing scope of Works for consultants and Request for Quotes (RFQ's).

Methodology

Phase 1: Development Application (Complete)

- Prepare concept layout plan,
- Concept bulk earthworks design to confirm suitability of concept layout plan,
- Complete Development Application.

Phase 2: Pre-Early Works Package (Current Scope of Works - Prepare a detailed scope of works for the project,

suitable to prepare Request for Quotes from required consultants, Development of the ultimate site layout plan

- Prepare a list of required consultants, Prepare a project timeline for design,
- Schematic building, services, and road interface-modelled in 3d -service corridors and basic building access interfaces to adjacent roads and operational requirements).
- Resolving existing site layout pinch points
- Schematic interim bulk earthworks strategy,
- Initial utility and authority discussions ie. (Urban Utilities, Energex),
- Schematic stormwater strategy (roof water, berms, swales, and basins),
- Topsoil strategy and potential utilisation/disposal of excess material,
- Schematic development of the stormwater Drop structures,
- Begin obtaining quotes for consultants.

Phase 3: Bulk Earthworks/Stormwater Operational Works Application - prepare Operational Works package for:

- Operational Works bulk earthworks strategy,
- Detailed Design stormwater strategy (berms, swales, and basins),
- Detailed design topsoil, Erosion and Sediment Control,
- Detailed design of the stormwater pit and pipe system, drop structures and
- culvert, etc.,
- Detailed retaining wall design.

Phase 4: Detailed Design (Internal to property boundaries – (Future Scope of Works to be designed concurrently as Phase 3). Phase 4 will encompass all scope of work internal to the property boundaries relating to all building design elements, roads, services (below ground), landscaping, etc.

Phase 5: Detailed Design (External to property boundaries - DTMR) (Future Scope of Works to be designed concurrently as Phase 4).

- Phase 5 will encompass all scope of work relating to the Department of Transport and Main Roads
- (DTMR) scope of works, i.e., Toowoomba Connection Road upgrade and submission to DTMR.

Phase 6: Detailed Design (External to property boundaries – Lockyer Valley Regional Council)

Phase 6 will encompass all scope of work relating to the Roches Rd upgrade as conditioned by The Lockyer Valley Regional Council and relevant Council submission.

Phase 7: Utilities/Services Connection (Future Scope of Works) Phase 7 will encompass the Urban Utilities and Energex connection submissions.

Phase 8: Tender / Construction (Future Scope of Works)

Project Delivery – LVFVPCO is responsible for assessment and management of project feasibility and business case Project governance, undertaking 'whole of project' decision making and providing direction to the design Team.

- Management of project cost plans
- Undertaking communication with the client, stakeholders, and the like.
- Management of the consultant team for 'whole of project' delivery

Data Requirements

- Survey (contour) data for the site in electronic format (3D file) to MGA and AHD coordinates including surveyor's triangulation file (to be discussed with client)
- Proposed development layout in .dwg format.
- Landscape architect/ecologist drawings (tree retention, environmental constraints etc.
- Geotechnical investigation report (received).

Summary

Lockyer Valley Foods have prepared an estimate of the project's capital expenditure based on new, high technology and well-used complimentary equipment. The proponent's project management team have vast experience in the manufacture and installation of the range of equipment like those proposed for this project. Lockyer Valley Foods have identified the enterprise's critical imperative, which is to build an engineering and operational culture on site, in time for the start-up of the project. As the proposal is a Greenfield Project there is no on-site history, or a pool of experienced operators to draw on, as is the case with existing enterprises.

Lockyer Valley Foods plans to address this lack of culture, and on-site history, by involving the proposed operational and maintenance staff in the original build. The usual practice is for original equipment suppliers (OEM's) to engage their own engineering installation crews who fly in from distant places, install the equipment, then leave. This leaves an experience vacuum on site, which is usually remediated by the clients having to pay the OEM's to continually engage technicians to return to the site for adjustments which should have been performed by trained, on site, plant maintenance staff.

As part of this plan, Lockyer Valley Foods will engage their own fabricators, technicians, and tradesmen to perform as much of the building and installation as possible. This has several tangible benefits to the long-term running of the plant. The onsite installers gain valuable insights into the specialised knowledge required to maintain the equipment. This approach vests ownership in the efficient running of the plant to the crew who installed the equipment and who are then retained by the enterprise, as maintenance staff.

The plant management must then acknowledge the essential contribution of the maintenance crews, preserving their self-esteem, a management course of action which ensures the ongoing efficient running of the plant. This approach also eliminates several layers of consultants, head contractors and major sub-contractors, all of whom contribute unnecessarily to the final costs of the project, but more importantly take their onsite knowledge away with them. These unnecessary layers of costs are being eliminated by the proponent's project management model.

Strong interest is being shown by co-packers and retailers in the ability of the enterprise to grow and process Roma Tomatoes for canning whole and chopped tomatoes, as well as tomato juice and tomato paste products. To deliver on these expectations Lockyer Valley Foods will be required to extend the originally proposed building to accommodate autoclaves, packaging equipment and filled can storage, as well as increasing the steam and electricity generation on site. Specialised tomato processing equipment is also needed.

It is proposed to detail the CAPEX for the tomato processing capacity separately so that the option to insert the tomato line capital works into the building program, can be taken at any time during the capital fund raising program, as funding milestones are reached.

Questions and Answers

Why Queensland?

- Two summer crops and winter crops in the south.
- Winter crops for at least 6 months in the north
- Southern states only one crop, factory plant is 3 sizes larger to accommodate shorter growing season.
- Only plant of its kind.

Why is Lockyer Valley the logical choice?

- 7th most fertile growing region globally.
- Water availability.
- Artesian.
- Wastewater able to be fully ulitised.
- Toowoomba, Lockyer valley and Ipswich as key labour pools.
- Withcott Land.- perfect and community accepted site.
- High elevation to assist in facility recognition.

- Second busiest highway.
- Landform assists with plant design and operation.
- Good site drainage and gravity flow of waste liquids to disposal points.
- Capacity to grow the desired crops as required.

Delivers

- **Integration between farmers and the functioning of the factory.**
- **Identify farmers production constraints.**
- **Recognise adjustments that the factory could implement to help**.

INNOVATION

Targeted Approach

This project involves the development of a unique plan to integrate growers and processor, to eliminate waste and optimise efficiencies. The key element used in attaining integration was to first identify existing problems, then design and incorporate the many innovations which are needed to address current constraints. Adoption of the innovations will result in the production of internationally competitive products for the benefit of all stakeholders.

ATTRACT, DEVELOP, RETAIN

Core Innovation Program

- Energy Efficiency
- Waste Treatment Efficiency
- Kinetic Efficiencies
  - Harvesting Efficiencies
  - Transport and Crop Handling

    - Minimise Produce Damage
    - Streamline Factory Operations
- Optimising Farmers Efficiencies
- Eliminating Chemicals from Weed and Pathogen Controls
- Developing Internet Farm Management Tools to Streamline Safety Audit Trails

Core Economic Program

- Capitalises on ideal farming location for year-round cropping programs
- Resulting in one third of the capital requirement than that of other regions
- Generating own electricity for 25% of standard tariff
- Fabricate own metal cans to save 65% of currents costs
- Operational savings returned to the farmers to ensure reliable supply

Direct Benefits to the Economy and Queensland

- Saving the pineapple industry in Queensland from extinction.
- Direct employment 200 staff rising to 600.
- Reliable destination for farmers produce. Regulated market and supply.
- Increased opportunities for farmers to expand.
- Internationally competitive, enabling strong export drive
- Leading by example, demonstrating that Australian manufacturing can compete internationally when integrated innovations are adopted.
- Fertiliser App to deliver fertiliser saving of $20 million per annum.
- Herbicide App minimise chemical runoff to The Great Barrier Reef. Environmental benefits from this program will help protect our precious reef and marine ecosystems.
- Increase payments to pineapple growers of over $5 million per annum, increasing over time.
- Reduced use of herbicides and pesticides delivers savings of at least $10 million annually.
- Export sales and blue-sky potential worth more than $90 million per annum.

BLUE SKY

The Scoping Plan for the Lockyer Valley food processing facility at Withcott has been designed to easily accommodate changes in plant layout over the plant design life of fifty plus years. The main building envelope has been designed around the style of an aircraft hangar, where there are no internal columns supporting the roof. This approach has been chosen so that present and future planning can take place unhindered by the presence of structural columns. This approach has allowed the building envelope design and approval process to continue to final approvals while the fine details of the actual plant internal selection can still be made. This will also facilitate the building construction process to proceed to building a roof over the construction site so that concrete and below ground works can proceed according to schedule without disruptions caused by the weather.

The building footprint also allows for the building to be extended along the logical direction of material flow. At the final product exit points the building can be extended to double the current pallet holding capacity to over twenty thousand pallets without disrupting current operations. At the incoming end of the building the design allows for a doubling of the production floor area, also without disruption to the existing production capability.

In the region where the new building will join the existing building a seventeen meter wide corridor is present in which to locate equipment which will seamlessly join the new processes to the existing plant facilities.

This approach makes possible the option to consider the addition of many different food manufacturing processes when commercial opportunities present themselves. The adoption of new processes and equipment usually involves considerable constraints imposed by the existing structure, services, material flow and equipment relocation. This is not the case with this project design.

The business plan centres around implementing innovative processes to fully capitalise on converting as much of the incoming produce into profitable items, to optimise grower's incomes.

OPPORTUNITIES

Pineapple

A significant challenge exists in the industry to find additional sales opportunities for pineapples other than solid in cans and

juicing. Under the current situation growers receive a premium price of around $400 per tonne for fruit which fits a tight canning specification and a much reduced price of $120 per tonne for juicing pineapples. For the canning grade only 27% of a fruit is finally canned.

As a further discouragement the present cannery has twenty-seven criteria which attract a deduction in the grower's price, where the actual price is around $340. It is the proponent's goal to find higher value sales opportunity for the juicing pineapples and the otherwise sound pineapples which do not meet canning specification.

To achieve this, the proponents have incorporated profile peeling equipment into their line to efficiently recover an additional 25% of solid pineapple for use in products other than pineapple rings in cans. These alternative opportunities will involve freezing pineapple small pieces and macerated cores into spheres, these will capitalise on the bromelain in the cores which is a developing health food craze.

This approach uses the waste cores and low value crushed pieces into a higher valued product. Frozen pineapple pieces as individuals or as shish kebabs on sticks will also be made, these will allow the plant to utilise the hybrid variety pineapples which are currently not suitable for canning.

Another more profitable opportunity exists to manufacture pineapple juice products at the premium end. Currently most pineapple juice is concentrated and attracts a world price of only $2500 per tonne, which costs more than $4000 per tonne to make. The current end use for the concentrate is to make low value reconstituted fruit drinks which typically wholesale for $1 per litre.

Opportunity exists to create a line of premium drinks using other Queensland high quality fruit ingredients which make drinks which attract $2.50 per litre. In pineapple growing the crop has a first crop then a ratoon crop, the ratoon crop is characterised by the presence of several small fruits which are usually consigned to juice. Because of the production of concentrate is a losing proposition the current cannery limits the intake of these juicing pineapples.

However, if premium products were produced then the plant could accept more of these fruits and so help to make the pineapple growers more viable and ensure that pineapples are continued to be grown.

The proponents have budgeted to pay the growers around $500 per tonnes for premium grade and $400 for sound but not acceptable for canning, this is highly attractive to the growers who assure the proponents that these prices will ensure continued and even increased plantings of pineapples.
In 2003 Queensland's canned pineapple industry processed 140,000 tonnes of pineapple per year, it currently processes 20 to 25,000 tonnes of pineapples.

The proponents can produce canned pineapples competitively with premium imports; local demand has increased since 2003, so the proponents assert that in view of their competitive pricing brought about by the highly efficient design of the enterprise, that the current 20,000 tonnes of processed pineapple in the business proposition is very conservative when compared with recent historical production and the other opportunities identified in this report.