

STANBROKE

Three Rivers Irrigation Project

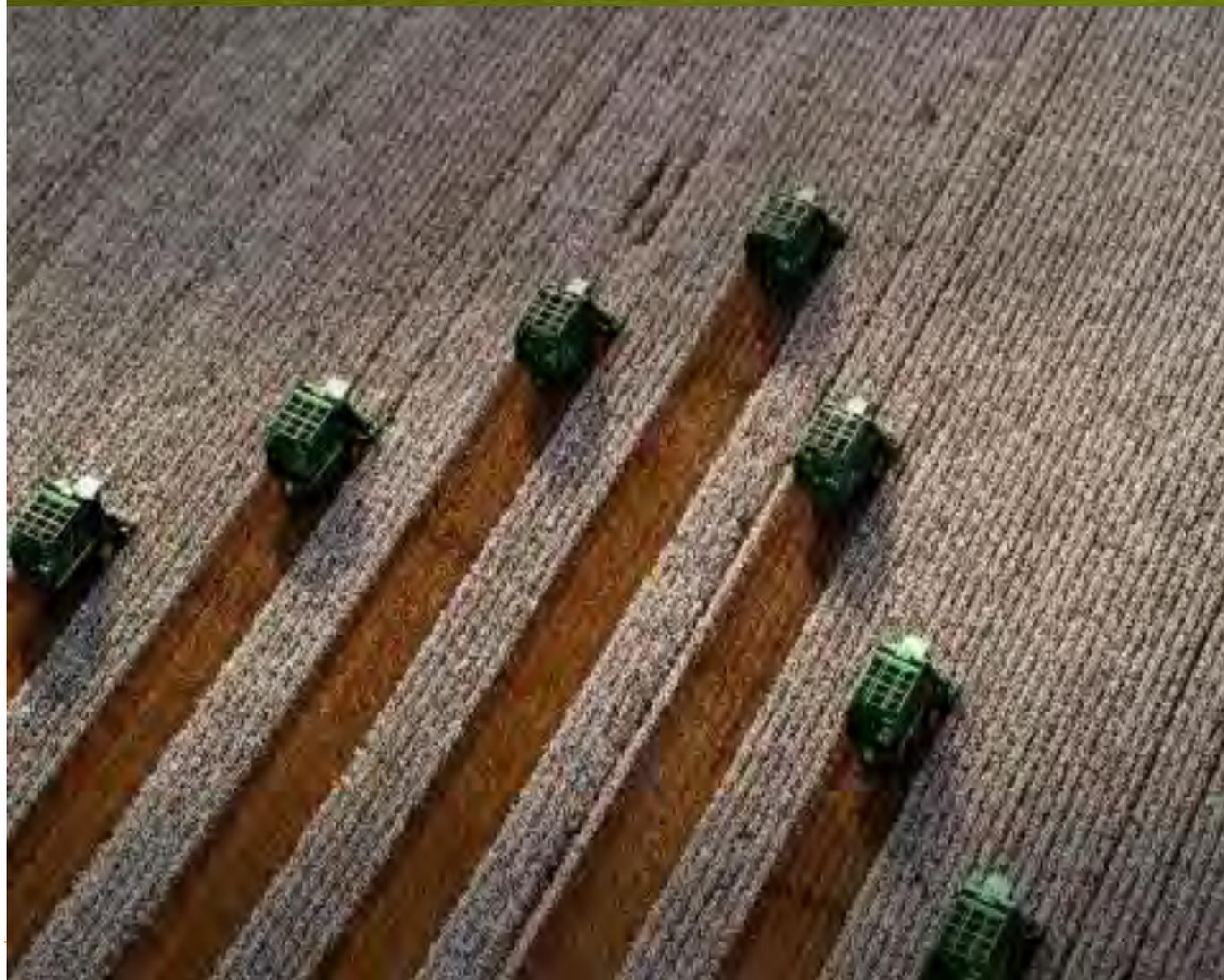


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GLOSSARY

Acronym	Definition
AHD	Australian Height Datum
ALC	Agricultural Land Class
ASS	Acid Sulfate Soil
BMP	Best Management Practice
CAMBA	China-Australia Migratory Bird Agreement
CLR	Contaminated Land Register
CMD	Coastal Management District
CSIRO	Commonwealth Scientific and industrial Research Organisation
DAFF	Department of Agriculture, Forestry and Fisheries
DATSIMA	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
DEHP	Department of Environment and Heritage Protection
DNRM	Department of Natural Resources and Mines
DNPSR	Department of National Park, Sport and Racing
DotE	Department of the Environment
DSEWPAC	The former Department of Sustainability, Environment, Water, Population and the Arts, now Department of the Environment
DSITIA	Department of Science, Information Technology and Innovation
EIS	Environmental Impact Statement
EMR	Environmental Management Register
EP Act	Environmental Protection Act 1992
EPBC Act	Environment Protection and Biodiversity Conservation Act
ERA	Environmentally Relevant Activities
FSL	Full Supply Level
GL	Gigalitre
Gulf WRP	Water Resource (Gulf) Plan 2007
Ha	Hectare
IAR	Impact Assessment Report
IAS	Initial Advice Statement
IECA	International Erosion Control Association
ILUA	Indigenous Land Use Agreement
IUCN	International Union for the Conservation of Nature
KRA	Key Resource Area
JAMBA	Japan-Australia Migratory Bird Agreement
LL	Lands Lease
MCU	Material Change of Use
ML	Megalitre
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NQIAS	North Queensland Irrigated Agriculture Strategy

Acronym	Definition
OESR	Office of Economic and Statistical Research (now Queensland Government Statistician's Office)
ONA	Office of Northern Australia
RE	Regional Ecosystems
RIPA	Regional Planning Interests Act 2014
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
ROL	Reconfiguration of a Lot
SDPWO Act	State Development and Public Works Organisation Act 1971
SLC	Special Least Concern
SPA	Sustainable Planning Act 2007
TEC	Threatened Ecological Community
TRIP	Three Rivers Irrigation Project
USL	Unallocated State Land
VM Act	Vegetation Management Act 1999
WRP	Water Resource Plan

EXECUTIVE SUMMARY

Stanbroke Pty Ltd (Stanbroke) is proposing the Three Rivers Irrigation Project on Glenore property in the Lower Flinders catchment. The project is a response to government policy initiatives to foster development in northern Australia, including development of irrigated agriculture in the Flinders and Gilbert catchments of the Southern Gulf region of Queensland.

The project is a 15,000 ha cotton farm and associated ginnery. The project aims to sustainably grow cotton for the export market and utilise the cotton seed by-product as supplementary feed for beef cattle in the dry season. The project will require a water allocation of approximately 150,000 ML. The site was chosen because it is downstream from the junction of the three major rivers in the catchment, is essentially flood free, is dominated by black soils suitable for irrigated agriculture and has a low risk of induced salinity. The project includes staged construction of the following:

- Water extraction infrastructure (possibly a diversion structure or weir, pumps, pipes/channels)
- Offstream water storages
- Farming area fields, levees, irrigation system, sheds and workshop
- Accommodation for both construction and operations staff
- A landing strip
- A cotton ginnery in subsequent stages of the development.

Minor enabling and ancillary works are also included but provision of 3-phase power is not. The project also includes operations phase cropping, water management, pest control, waste management, harvesting and ginning. Cotton fibre will be sold to merchants from the ginnery then transported under their ownership to a port for export.

The project will be funded by Stanbroke. Capital cost of the project is estimated at >\$200M. If approved, the project would be constructed between 2016 and 2018 and be operational in 2019. It would provide up to 100 on-site jobs in the construction phase and up to 75 in the operations phase at peak production. The workforce will vary seasonally. Off-site employment creation will be considerable and should lead to expansion or establishment of support industries in the region.

Petheram et al. (2013) reported the gross value of the Gulf fishery (not including prawns) as \$22.5 M (2011-12) and that of the prawn fishery as \$94.7 M (2010-11). At approximately \$69 M at peak production, Three Rivers Irrigation Project (TRIP) is a significant project.

Glenore holding is zoned Rural and has an area of approximately 234,000 ha of which the project will require approximately 22,422 ha. The farming area is predominantly grassland which is currently managed for grazing and classed as Agricultural land Class A. Riparian vegetation abuts the Flinders and Saxby rivers. All vegetation communities are listed as "Least concern". Threatened flora or fauna species or communities are not expected to occur in the area and none were encountered in field studies conducted to date. The Freshwater sawfish, listed as Vulnerable under the Environment Protection and Biodiversity Conservation Act, may be present in the area and while its local population is unknown, it is not expected to be significant given the generally dry nature of the river. A survey of the aquatic environment in the area of the project using nets, electrofishing and side-scan sonar did not encounter the species. If a weir is included in the project rather than a diversion structure, it will incorporate a fishway designed to cater for all species.

The nearshore coastal environment of the Southern Gulf is considered sensitive and high value. As the median flow of the Flinders River would be maintained at 72% of pre-development under the Draft amended Water Resource Plan, and the Flinders contributes only 16% of the flow from all rivers entering the Southern Gulf, the likelihood of significant impact is considered remote.

Iffley Road traverses the project site. There are no exploration permits, key resource areas or haulage routes within close proximity to the project area. The site is not serviced by water or wastewater utilities.

There are no sensitive receptors within 8 km of the project area; no currently registered Cultural Heritage body; and no registered sites of indigenous or non-indigenous cultural heritage significance.

The population of Carpentaria Shire is 2,225 persons of which approximately 37% are of Aboriginal or Torres Strait Islander descent. The shire has a relatively high unemployment rate. The nearest township is Normanton approximately 90 km to the north. The town has an airport, hospital, childcare centre, state school for Prep to Grade 12, aged care facilities, Police, Ambulance, social and recreational facilities. The town caters for tourists, with a number of lodges, motels and restaurants.

Various approvals are required for the project. Stanbroke will seek approval through the State Development and Public Works Organisation Act via designation as a coordinated project. The ensuing impact assessment studies and consultation program will provide Stanbroke with opportunities to improve the project via avoiding or minimising impacts and maximising benefits, particularly social and economic benefits to the Gulf region.

1. INTRODUCTION

1.1. Background

Stanbroke Pty Ltd (Stanbroke) operates extensive land holdings in the Gulf region of Queensland, breeding and rearing cattle for domestic and export beef markets.

Stanbroke is seeking to diversify its activities, and has identified the potential for cropping at the Glenore holding south of Normanton. Cotton production is proposed at this location, for the following reasons:

- Cotton is one of the highest gross margin crops and one of the few that could be grown profitably in the region (Petheram *et al.* (2013))
- The proposed area is largely flood free
- The soil type at the proposed site is suited to growing cotton
- The produced cotton seed will provide important supplementary dry season feed to beef cattle in the region.

The seasonal availability of water resources limits the range of agricultural activities possible in the region, with dryland cropping proven to be unviable in most years. Irrigation is therefore necessary.

The Three Rivers Irrigation Project (TRIP) will result in the establishment of irrigated cotton fibre and seed production at a scale which will support construction of a ginnery and drive development of support industries in the region.

1.1.1. Purpose and Scope of the Initial Advice Statement

This Initial Advice Statement (IAS) provides an overview of the proposed project, the proponent, existing environmental conditions and an evaluation of the requirements for management of environmental impacts. The IAS also identifies those aspects of the project likely to be considered 'critical' or 'routine'. This will inform the preparation of the Terms of Reference, as well as enable efficient and transparent assessment and evaluation of the project impacts and benefits.

The IAS has been prepared to support an application to the Coordinator-General to declare the project under section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWOA) to be either:

- A coordinated project for which an Environmental Impact Statement (EIS) is required; or
- A coordinated project for which an Impact Assessment Report (IAR) is required.

Alternatively the Coordinator-General may declare the project to be a coordinated project for which an EIS or IAR is not required, if they are satisfied that an environmental impact assessment is not required or an appropriate environmental impact assessment would be carried out under other legislation.

The IAS provides information for stakeholders, the general public and other interested parties about the proposal. It also identifies the subsequent development approvals likely to be required for the implementation of the project, once the assessment process under the SDPWOA is complete.

The IAS includes consideration of the staged construction of the following:

- Water extraction infrastructure (possibly a weir or diversion structure, pump station, pipes/channels)
- Offstream water storages
- Farming area fields, levees, irrigation system, sheds and workshop
- Accommodation for both construction and operations staff
- A landing strip

- A cotton ginnery in subsequent stages of the development.

Other enabling and ancillary works to be considered in the assessment include:

- Early works e.g. geotechnical, soils and hydrological investigations
- Works on Iffley Road, temporary roads and access tracks
- Other ancillary infrastructure (e.g. river flow gauging stations associated with water extraction).

The project also includes operations phase cropping, water management, pest control, waste management, harvesting and ginning.

The following aspects, although important considerations for the project are not included in the scope of the project:

- Provision of three-phase grid power of sufficient capacity to the site
- Upgrade of Walkers Bend Bridge
- Upgrades or development at any Port.

2. THE PROPONENT

2.1. Stanbroke Pty Ltd

Stanbroke is a vertically integrated beef company. A key focus of the business is supply chain management, based on the principles of 'paddock to plate'. Other focal points of the business are environmental custodianship, sustainable land use and innovation.

Stanbroke operates 1.6 million hectares of prime cattle country in the Gulf region including the following properties:

- Miranda
- Donors Hill
- Mc Allister
- Glenore
- Augustus
- Fort Constantine.
- Warren Vale
- Kamilaroi

Stanbroke also operates a feedlot in Chinchilla and meat processing and packaging facilities in Gatton.

In total Stanbroke employs 650 staff.

The Stanbroke holdings in the Gulf region have been farmed for more than 50 years. Stanbroke is fully owned by the Menegazzo family who bought their first property in the region, Warren Vale, in 1983. The Menegazzo family independently owns Glenore but it is operated by Stanbroke.

Beef products produced by Stanbroke are branded as Diamantina Beef and exported to more than 30 countries.

As the operators of a globally recognised, large-scale Australian agribusiness, Stanbroke has successfully implemented numerous projects and developments over the years. Recently, Stanbroke signed a Memorandum of Understanding with the Queensland Government to work with a specialist job service provider to *'supply and support 50 new recruits from culturally diverse backgrounds'* at Stanbroke's Gatton facilities (Health and Community Services Committee Estimates, Qld Government,

<http://www.parliament.qld.gov.au/documents/tableOffice/TabledPapers/2014/5414T5414.pdf>).

Stanbroke holds all necessary approvals for all facets of its operations. Regular environmental audits are carried out at the processing facility and feedlot.

In partnership with Southern Gulf Management Group, in the past decade Stanbroke has fenced off some 90 km of rivers to protect riparian areas as well as undertaken intensive woody weed control. In conjunction with Northern Gulf Management Group Stanbroke leads the way with mapping programs and participates in development of leading technology to measure both grazing pressure and water points to identify and protect riparian areas. In the last five years (in coordination with the Carpentaria Land Council) Stanbroke has culled an estimated 33,000 feral pigs on its properties.

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Principal consultants supporting Stanbroke in the feasibility and initial environmental investigations include EM (Ecology Management), SMEC Australia, OD Hydrology, NRA Environmental Consultants, Hydrobiology, 3D Environmental, SMK and LRAM.

3. THE NATURE OF THE PROPOSAL

3.1. Scope of the Project

TRIP includes infrastructure to support extraction of river water, collection of overland flow, offstream storage of extracted water, an irrigated cotton farm and a cotton processing ginnery. The project area and regional context is shown in Figure 1. More detail of the proposed farming area is shown in Figure 2. The project aim is to sustainably grow cotton for the export market and utilise the cotton seed by-product as supplementary feed for beef cattle in the dry season. The latter is a key limiting factor for the cattle industry in the region. Each major component of the development is described below. The description is preliminary and may alter as further investigations are undertaken.

3.1.1. Water Extraction

Water will be sourced from the river, from overland flow harvesting, and from farming area runoff. Gravity diversion is favoured but it is unlikely to provide the full volume required. A series of pumps will also be required adjacent the river and will be of a capacity which could extract the necessary volume in a short timeframe. The necessary number of pumping days will be optimised during further studies. The volume to be targeted (from all sources) is approximately 150,000 ML per annum, of which Stanbroke already holds an allocation of 28,800 ML.

The pumps will deliver water to an open channel which will transfer the water <2 km to the offstream storage location as well as having the ability to pump direct onto the farm.

3.1.1.1. Three Rivers Weir

If necessary to assist with water extraction, a weir may need to be constructed on the lower Flinders River. Such a weir would primarily serve as a pumping pool with the purpose of increasing the reliability of water extraction. Hydrologic modelling will be undertaken to confirm the benefit of the weir. If a weir would not deliver significant benefits with regard to water extraction reliability, it will not be included in the Project. If included, it is anticipated the weir will be of concrete or sheet pile/concrete construction with a crest approximately 5 m above the river bed. The width of the river in the likely location is >140 m and the banks are approximately 8 m high. The abutments will be at or near bank height and extended to protect the banks during high flows. The weir will have a fishway and the ability to release low flows. The pool created by the weir would extend approximately 12 km upstream at maximum capacity. Several options for the location and construction type are to be evaluated through the concept design process.

3.1.2. Offstream Storages

The offstream storages will be of multi-cell design with a total capacity of approximately 150,000ML. They will be constructed from local clay and to the maximum safe depth in order to minimise water surface area. Wall height is anticipated to be up to 8m above natural ground level.

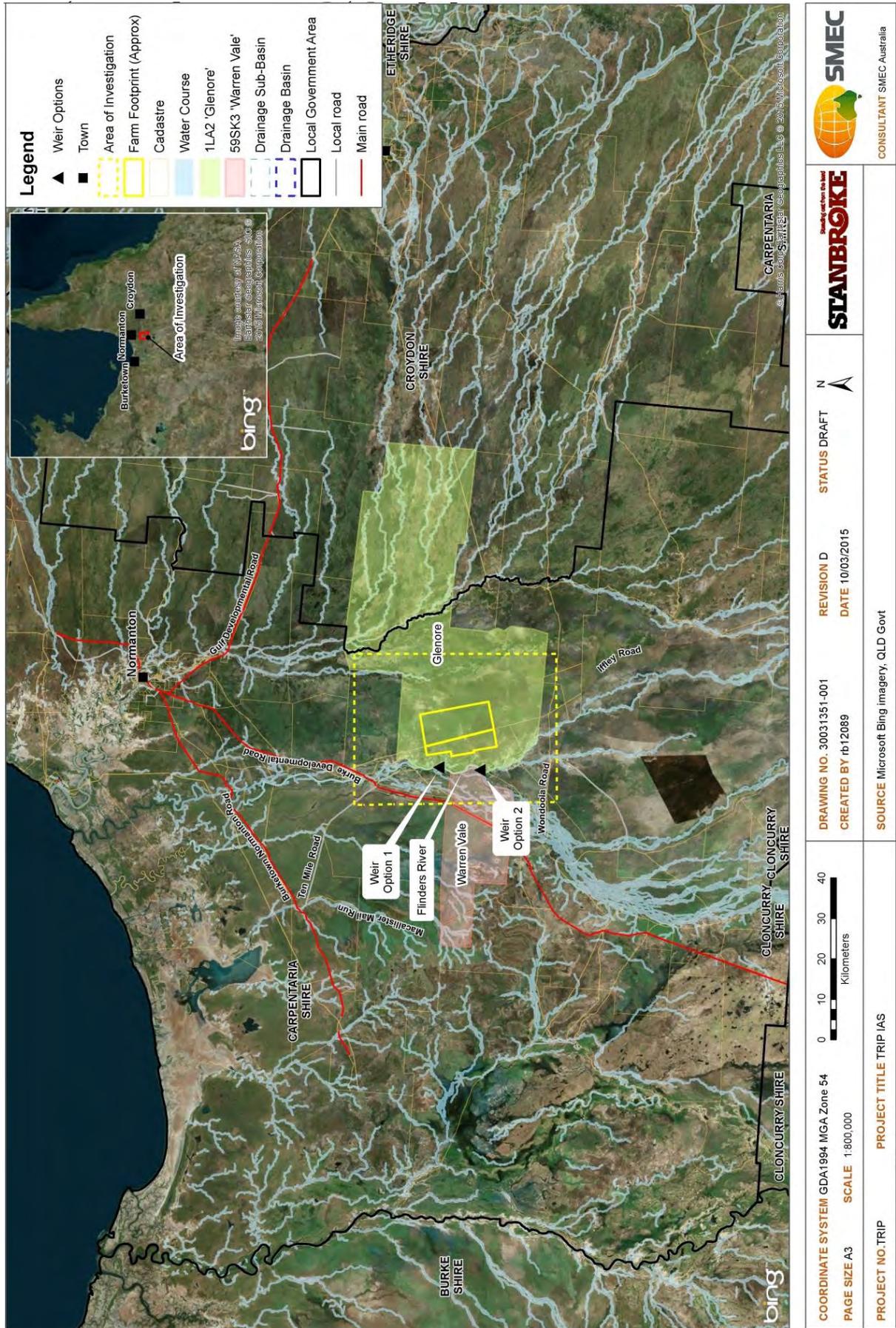


Figure 1: Project Location

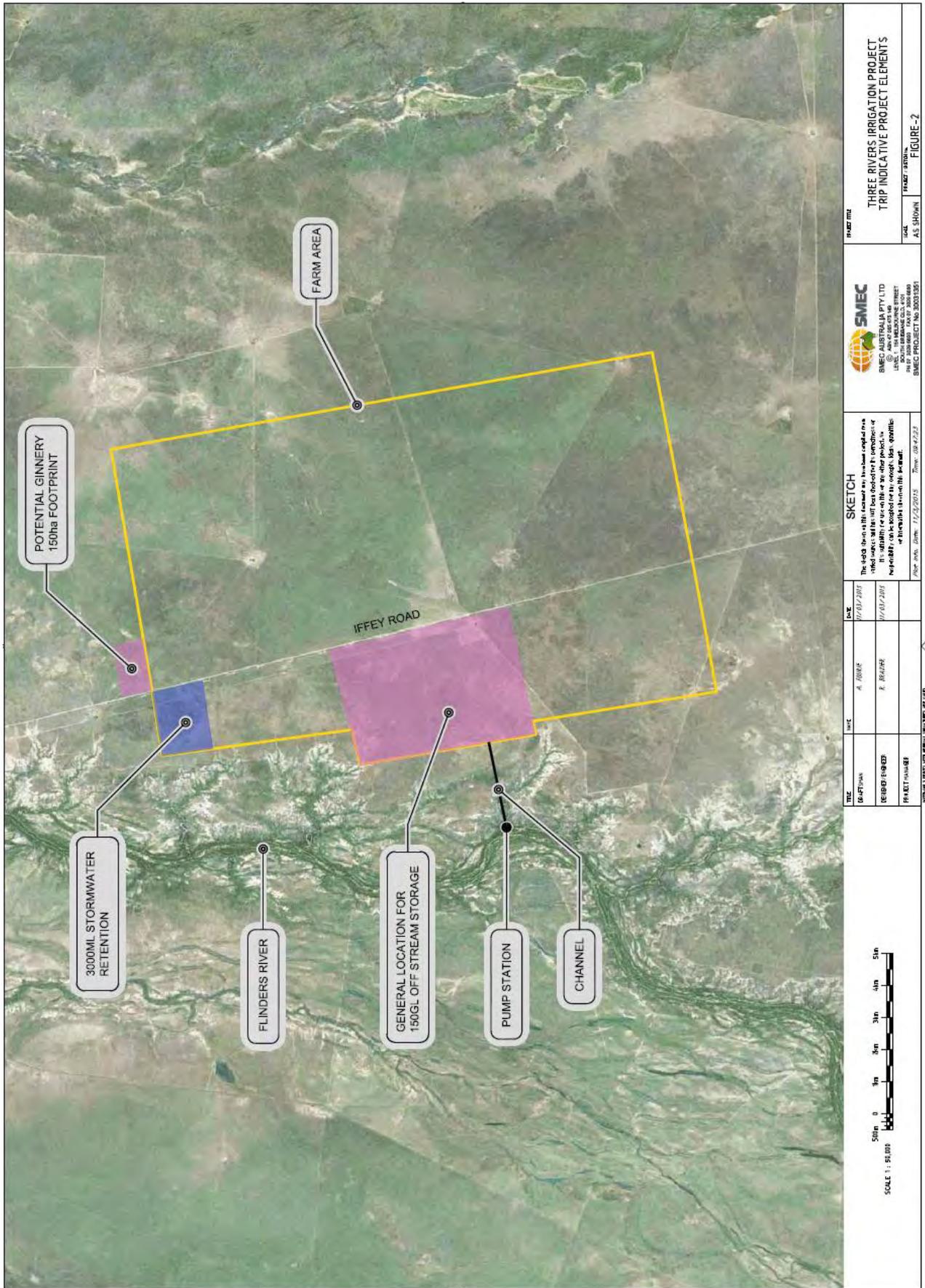


Figure 2: Project Elements

3.1.3. Cropping Area and Water Management

The farming area will include 15,000 ha of cropping fields, the aim being to grow the maximum area of cotton that water availability allows in any one year. When water is not available or in limited supply, the fields will be left fallow or a rotation crop will be grown. Petheram (2013) suggested numerous crops would likely be feasible in the area including sorghum, mung bean and guar. Further soil and climate studies will be undertaken to confirm appropriate crops. Additional area is required for associated water management channels, pump stations for water re-distribution, trafficable areas, fuel tanks, machinery storage, a landing strip and chemical / fertiliser storage. The total area is approximately 18,000ha. A stormwater retention system is included in the design, as is tailwater recycling.

3.1.4. Ginnery

A cotton ginnery will be constructed as part of the project. It will likely be on Glenore and adjacent to Iffley Road. It is proposed as a two-stand ginnery with capacity to expand to four-stand. The expansion would occur should cotton production in the region expand, either through further development by Stanbroke (not as yet planned or proposed) or by other farmers in the area choosing to grow cotton. Unless suitable power supply is developed in the local area, the gin may need to be constructed near an existing supply, potentially near Cloncurry. If that is the case then approval for the ginnery would be sought separately. A suitable power supply may constitute three-phase grid power, gas, or another alternative which will be investigated during future studies.

3.1.5. Cotton Sale and Export

Merchants purchase the cotton from the ginnery and it is under their management and ownership from that point. All export cotton grown in Queensland is currently shipped from Port of Brisbane. It is anticipated that if a significant industry develops in the Gulf, export from a northern port could be preferred.

3.1.6. Cotton Seed

Seed is separated from the cotton at the ginnery. It will be trucked to Stanbroke's existing storage facilities on their farms in the region. This may require limited transport on public roads as several of the Stanbroke properties adjoin. Supplementary cattle feed is currently sourced from southern growing areas.

3.2. Land Use

The project site is located near the western boundary of the Glenore holding and to the east of the Lower Flinders River. The site is currently utilised for cattle grazing, primarily on native pastures, as part of the Stanbroke operations. The Project site, depending on final designs will likely be traversed by Iffley Road (the Normanton – Julia Creek Road).

Proposed permanent land uses include water harvesting, water storage, irrigated cropping, machinery workshop, fuel storage, agricultural chemical storage, worker accommodation, landing strip and ultimately operation of a cotton gin. Temporary land uses include construction activities. The remainder of Glenore, being the bulk of the property, will remain in cattle production.

3.3. Project Need, Justification, and Alternatives Considered

3.3.1. Relationship to Government Policies and Strategies

The Australian, Western Australian, Northern Territory and Queensland governments are together implementing a comprehensive plan for the sustainable development of northern Australia through the *Northern Australia Sustainable Futures* program managed by the Australian Government's Northern Australia Ministerial Forum. As part of that program the Office of Northern Australia (ONA), within the Department of Infrastructure and Regional Development, has co-ordinated the North Queensland Irrigated Agriculture Strategy (NQIAS). The NQIAS is a suite of projects investigating the potential for development of water resources in north Queensland that seeks to unlock opportunities for new and existing agricultural production.

In February 2014, the ONA released the Flinders and Gilbert Agricultural Resource Assessment (the CSIRO ARA; Petheram *et al.* 2013) which provided a broadscale evaluation of the feasibility, economic viability and sustainability of water resource development for the Flinders and Gilbert river catchments.

The CSIRO assessment concluded that there is potential to support irrigated agricultural development in both catchments for a range of crops and both catchments offered the possibility for irrigation development approaching or exceeding the scale of the current Ord River Irrigation Area in Western Australia.

As a result of this assessment, the Queensland Minister for Natural Resources and Mines released a Statement of Proposals to announce a review of the *Water Resource (Gulf) Plan 2007* (Gulf WRP). The review focussed on identifying additional volumes of unallocated water reserves for the Flinders and Gilbert river catchments and provided for those additional volumes through an amendment to the Gulf WRP. The Draft amended WRP was released in late December 2014 and included an increased volume of water in the general reserve which is much greater than that required by Stanbroke alone.

"The Queensland Government is committed to the development of an expanded irrigated agricultural industry in North Queensland and supporting agriculture as a pillar of the Queensland economy." The *Queensland Agriculture Strategy* (2013) aims to double agricultural output by 2040.

At a regional level the North West Queensland Strategic Development Study (released June 2014) was funded by the North West Queensland Strategic Development Study Working Group. The Group comprised members from local and state government, regional development bodies and mining organisations. The study covered a broad range of topics related to opportunities and limitations. It identified four strategic development priorities, one of which was irrigated and intensified agriculture and another was Supply Chain Productivity, Efficiency, and Reliability.

There is a clear commonness of purpose and goals across all levels of government related to the development of irrigated agriculture in the Flinders catchment.

3.3.2. Project Feasibility

The CSIRO ARA clearly supports the feasibility of irrigated agricultural development in the Flinders catchment *per se*. However the review was very strongly focussed on the upper catchment between Hughenden and Cloncurry. This was driven by historic and current interest, particularly in constructing one or more major in-channel storages to support an irrigation scheme. The report concluded that any such scheme was not economically viable without significant third party (viz, Government) capital expenditure on the infrastructure. The major limiting factor was the relatively low reliability of river flows. CSIRO therefore recommended smaller scale mosaic irrigation using on-farm (or off-stream) storages. In a later publication (Bayliss *et al.* 2014) CSIRO stated *"We note here*

that whilst the FGARA development scenarios outlined above underpin our risk assessment, in reality they only comprise one of many possible alternative development pathways for these catchments”.

This key limiting factor recognised by CSIRO is not such a constraint in the lower Flinders as flows are far more reliable and larger in the lower catchment (Section 5.1.2). TRIP is sited to take advantage of being downstream of the junction of the three major rivers in the catchment; the Cloncurry, Flinders and Saxby.

Figures 5.24 to 5.26 of the ARA, reproduced in Figure 3, show a comparison of extraction reliability at three locations in the Flinders catchment. The x-axis scale varies with the available volume. Comparing the locations shows that the reliability of extracting 150 GL at Cloncurry dam site (refer 5.24a in Figure 3), is just a few percent and then only achieved with the largest pumps and a low pumping threshold (so extracting from low flows). The figure is improved at Richmond (refer 5.24b in Figure 3) but still only about 25%. At Walkers Bend closer to TRIP (refer 5.25a in Figure 3) the reliability is about 75%. The reliability near the TRIP site is only slightly reduced with a higher pumping threshold, so extraction would not affect low flows.

The only limiting agricultural factor identified by CSIRO in the lower Flinders catchment was flooding. The area selected for farming on Glenore is largely flood free as was shown by aerial inspection by Stanbroke during the high level floods of 2009. The western side of the river supports a myriad of braided flood channels while the eastern side on Glenore, being the proposed farming area, is devoid of any such channels.

CSIRO estimated that only between 45 and 55% of the water extracted for irrigation from a theoretical scheme in the upper Flinders catchment would actually reach the roots of the crop, the rest being lost during transmission or via evaporation while in storage. The TRIP approach is more efficient because the point of extraction of water from the river is directly adjacent the offstream storages which themselves are deep and adjacent to the irrigation area. Similarly, TRIP will initially trial winter cotton. In this scenario the cotton can be planted shortly after the end of the wet season and can be harvested in early spring. It will commence growth on residual wet season soil moisture and irrigation will be completed prior to the worst of the dry season heat driving evaporation losses. Winter cotton is currently grown successfully in the Ord River irrigation area.

CSIRO suggested that ample suitable soils existed and that higher margin crops such as sugar and cotton were most likely to be economically viable. CSIRO also assessed the economic viability of irrigated forage crops to support the existing beef cattle industry through the critical dry season period and again in its own right this was either not strictly viable or marginal. What CSIRO did not assess, though the potential benefits were recognised, was combining the two approaches in an integrated enterprise. That is, grow a high value crop (such as cotton) which also provides supplemental dry season feed (cotton seed).

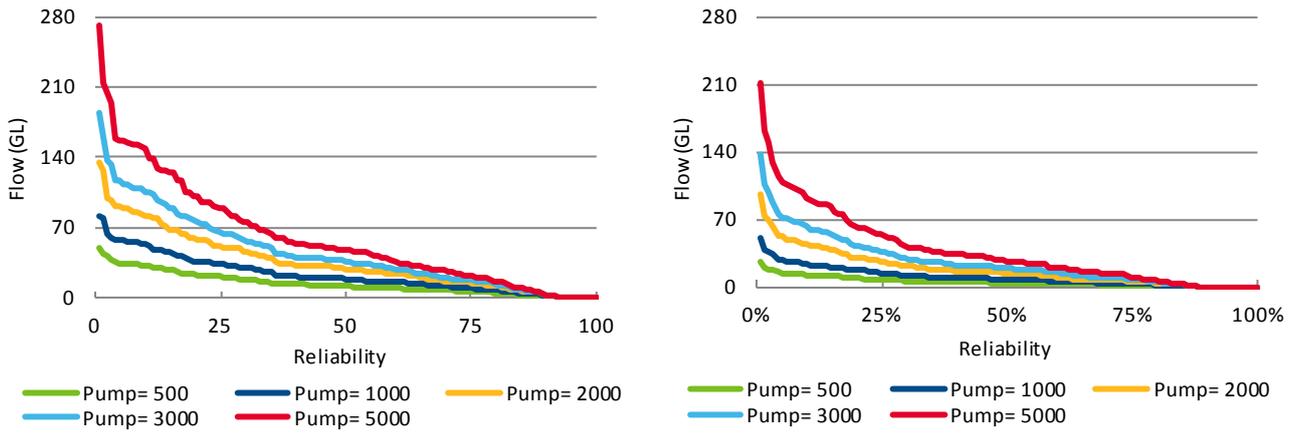


Figure 5.24 Annual volume of streamflow extracted versus annual time reliability for streamflow gauge 915204A
 (a) Commence to pump threshold of 100 ML/day. (b) Commence to pump threshold of 2000 ML/day. Pump capacities are in ML/day.

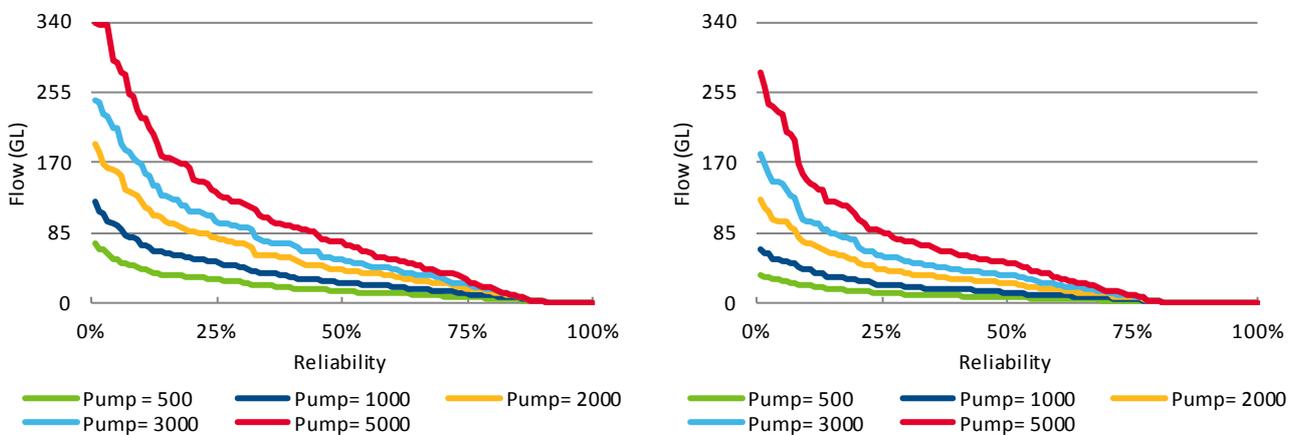


Figure 5.25 Annual volume of streamflow extracted versus annual time reliability for streamflow gauge 915008A
 (a) Commence to pump threshold of 100 ML/day. (b) Commence to pump threshold of 2000 ML/day. Pump capacities are in ML/day.

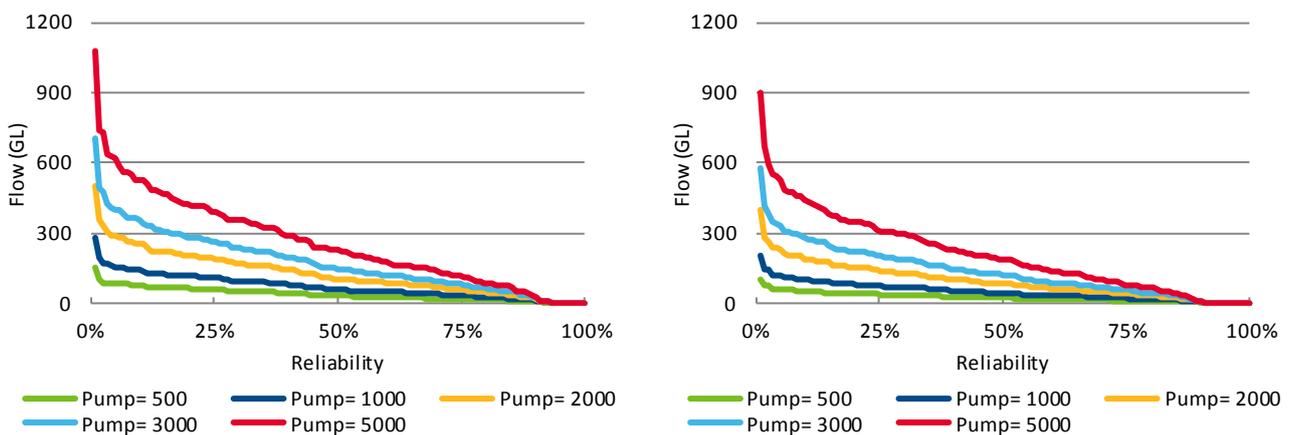


Figure 5.26 Annual volume of streamflow extracted versus annual time reliability for streamflow gauge 915003A
 (a) Commence to pump threshold of 100 ML/day. (b) Commence to pump threshold of 2000 ML/day. Pump capacities are in ML/day.

Figure 3: Reliability of Extraction, Three Selected Locations in the Flinders Catchment

(source CSIRO ARA, Chapter 5, Opportunities for irrigation in the Flinders Catchment)

The lack of a local ginnery to process the cotton and produce the seed was shown to be a significant constraint to development of a local industry. CSIRO estimated break-even yield at 3.2 bales/ha with a local ginnery or 6.1 bales/ha using the nearest ginnery in Emerald (over 800 km away). Given CSIRO estimated median cotton crop yield as 8.7 bales/ha, it is far more economical to use a local ginnery, if one existed. To establish a relatively small ginnery, for example a two-stand gin with provision to expand to four stands, would require at least 85,000 bales to support it. At the median production levels estimated by CSIRO, this would require nearly 10,000 ha of cropping area. CSIRO modelling was based on farm scale irrigation ventures of 500 ha. Hence sufficient production to support a local ginnery would require at least 20 such individual ventures and would be unlikely to occur. At least one large scale venture is required to ensure a local ginnery is developed and this in turn would assist in making the smaller ventures viable. The TRIP project serves this catalytic role.

A local ginnery ensures the generation of local employment and local support industries, which is the aim of government policy for the region.

TRIP would be funded by Stanbroke, so is financially feasible (evidence provided separately to the Coordinator-General). The project does not require direct funding by Government but would be assisted by Government support of upgrades to regional infrastructure and services, particularly of power. The Federal budget of May 2015 allocated \$5b (with \$800m in the current budget) to a Northern Australia Infrastructure Facility which targets supporting development of ports, rail, road and power supply.

3.3.3. Alternatives

The timing for commencement of the Project is dependent upon State (and possibly Australian) government approvals and commencement of the revised Gulf WRP. Implementation is dependent upon obtaining the necessary water allocation under the new WRP. If sufficient allocation is not obtained then development of a local ginnery becomes unviable. Without the local ginnery, the project is unlikely to be economically viable. As such, Stanbroke will submit an application to Department of Natural Resources and Mines (DNRM) to have the project declared a major water infrastructure project and will also seek a water development option. Stanbroke appreciates that at the present time these amendments to the Water Act, while passed by parliament, have not been commenced. If the Water Option is not available then procedures as incorporated in the Resource Operations Plan will be followed.

Availability of a suitable power supply is a key component of the project. The alternatives to three-phase grid power are either direct use of diesel fuel or generators which rely on either diesel or gas. The preferred option/s will be developed during further design stages and through consultation with service providers.

The inclusion and location of the weir is not finalised but if included it will be within an approximate 15 km length of river as illustrated in Figure 1. The final location will be selected prior to incorporation into assessment documentation. The pump location and farming area would alter in line with any particular weir location or mix of water extraction techniques but will remain in approximately the same position as shown in Figure 1.

The basis of design and the approach to construct any weir or diversion may also alter as more detailed information becomes available. Any such change is not considered likely to significantly alter the initial assessment of potential impacts.

Project construction will be staged to accord with business priorities. The water extraction infrastructure will be constructed first, followed by the river pump station and offstream storages, the farming area and finally the ginnery. The ginnery would only be constructed after cotton production levels had been evidenced. Until that time, road transport to the nearest gin (Emerald) would be utilised.

The location of the project on Glenore has been chosen largely because of its flood immunity, location downstream of the junction of all rivers in the catchment, apparently suitable soil types and proximity to major transport routes. It is not considered that other locations would be as suitable for the project though individual components may alter (e.g. as noted, the ginnery may need to re-locate).

Without the project there is a significantly reduced catalyst for agricultural and economic development in the Carpentaria region and both direct and indirect benefits will be forgone.

3.3.4. Objectives and Key Benefits

As a private company, the specific objectives for Stanbroke relate to business profitability and security, for both the stand alone cotton venture and their beef cattle production. If Stanbroke achieves its objectives, the following benefits will accrue either directly or indirectly:

- Diversification of regional agricultural products
- Increased output from irrigated agriculture in North Australia
- Increased security of and output from beef cattle production
- Increased diversity of regional support businesses
- Increased port throughput and possible expansion
- Increased regional employment
- Development of Northern Australia.

3.4. The Project to be declared

The project to be declared includes:

- Construction and operation of the water extraction system which may include the Three Rivers Weir or other in-river infrastructure, a water diversion channel, overland flow capture or a mixed approach
- Construction and operation of the river pump station
- Extraction of approximately 150 GL per annum of river water for the farming operation
- Construction and operation of offstream storages with a capacity matching the extracted volume
- Construction and operation of an irrigated agricultural area of approximately 15,000ha
- Construction and operation of a stormwater detention basin within the farming area and approval to discharge overflow to a watercourse
- Construction of levees on the floodplain
- Operational farming requirements such as fuel storage, workshop etc
- Construction of an air strip
- Upgrade to Iffley Road
- Establishment and operation of long term worker accommodation
- Construction and operation of a cotton ginnery.

3.5. External Infrastructure Requirements

The project does not include any provision of infrastructure off site, other than the upgrades to Iffley Road, but may rely on provision of services by others. The main requirement is for three-phase grid power of sufficient capacity for the ginnery and river pumps.

3.6. Timeframes for the Project

The project timeline is shown in Figure 4. It is anticipated that major approvals could be achieved by approximately May 2016. Detailed design and applications for individual approvals would then follow. Procurement and stockpiling of some materials and equipment and establishment of the construction camp could be undertaken in the dry season of 2016 but construction of the water extraction infrastructure would likely not commence till the dry season of 2017. These works could potentially be completed in one dry season. The river pump station foundations, offstream storages and inflow channels would be constructed simultaneously. The pumps would be installed during the following dry season so will be ready to transfer water to the offstream storages in the wet season of 2018-9. The duration of works in any season will be dictated by weather at the time.

The farming area would take approximately two years to prepare. The first dry season is devoted to leveeing, clearing, ripping and initial formation of the necessary channels, fields, drains and pump stations. Finishing of the formation and fit-out with pumps, bridges, valves, sheds, fuel storages etc. will occur in year two. The laser levelled fields will be ready to plant in year three, which is likely to be 2019.

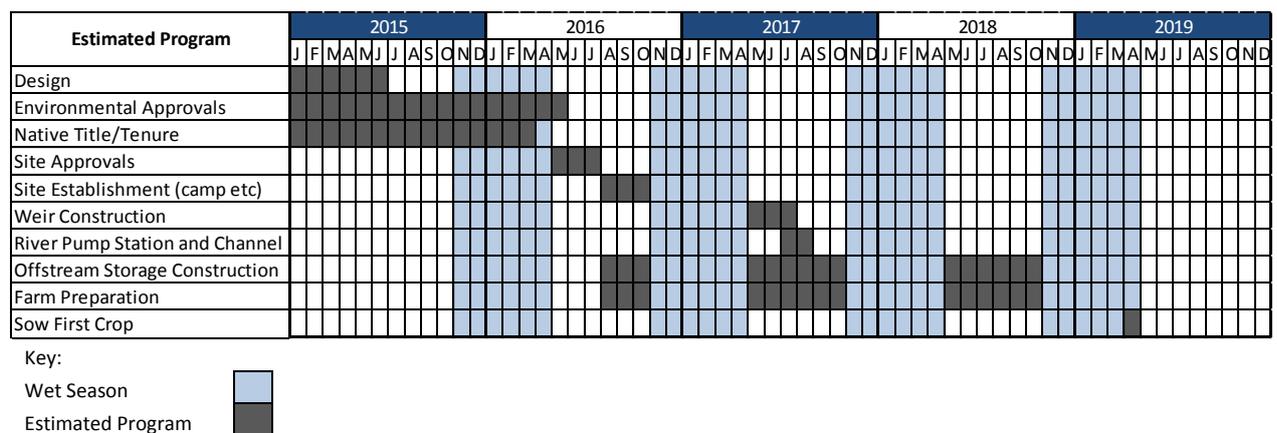


Figure 4: Estimated Program, 2015-2019

The ginnery would only be constructed once crop productivity was confirmed. At least three or four years of cropping would be necessary to provide certainty of output and to determine the interest of other parties in growing cotton. Procurement would therefore commence in about 2023.

Once operational, the lifetime of the project is indefinite.

3.7. Construction and Operational Processes

If shown to be justified, the weir is likely to be constructed of conventional concrete which will either be sourced from the existing supplier in Normanton or batched on site. In either case, existing licensed sources of raw materials will be used.

Access to water for construction purposes related to all phases will be required. It is anticipated this can be drawn from the Flinders River, possibly released from the Strategic Reserve.

Construction power will be sourced from existing mains sources where suitable or via transportable diesel generators.

Existing road and port facilities will be used for transport of construction material, while export of cotton will be the responsibility of the buyer (wholesaler). It will likely to be trucked to Normanton, Townsville or Brisbane. Any upgrade of port facilities is assumed the responsibility of others. A cumulative increase in cotton and other agricultural production across the region could trigger upgrades to infrastructure.

Iffley Road will likely pass through the cotton farming area and will serve as the main transport access route for both construction and operation. As the farm and ginnery will effectively be leveed, the road will need to be raised to cross the levees and bridged to cross the farm channels, though siphons may be used. If a more upstream site option is chosen, Iffley Road will not be directly impacted. The capacity of the road and the intersection with the Burke Developmental Road to handle the traffic will require investigation.

Waste and recyclables will be disposed to local facilities where feasible or trucked to suitable regional facilities under contract with licenced carriers.

Potable water will be based on treated rainwater. Grey water will be recycled. Toilet waste water during construction will be treated on site and used to irrigate the camp grounds. Sewage waste disposal will be in accordance with Carpentaria Shire standards. During operations, the worker accommodation will be maintained as farm offices and for use by contractors, seasonal workers, transport drivers etc.

3.8. Workforce Requirements during Construction and Operation

The estimated total on site construction and operations workforce requirement is shown in Table 1.

Table 1: On-site Construction and Operations Workforce

Component	2016	2017	2018	2019	2020	>2023
Water extraction infrastructure	15	35	1	1	1	1
River pump station		12	2	2	2	2
Off-stream storages and channel		20	1	1	1	1
Landing strip		0.5				
Farm		20	20	60	60	60
Ginnery						15
Ancillary	30	10	20			

Construction will use local contractors, labourers and suppliers wherever feasible. The workforce will be supplemented with a fly in-fly out contingent from Cairns via Normanton. Bus transport between Normanton and the site will be utilised. This estimate does not include the construction workforce for the ginnery given the disjunct timeframe of construction.

The offsite workforce prior to commencement of construction will include professional staff undertaking detailed design of all components, securing approvals, appointing contractors and procuring materials and equipment. During construction direct offsite employment will relate to batching and transporting concrete, freighting other equipment (particularly pumps, pipes pre-

fabricated metal, fuel, ginnery machinery), accommodation services (provisions, cleaning and maintenance) and waste disposal.

The operational workforce (fte, seasonal) on site when fully developed is predicted to be:

- Farm; 60
- Ginnery; 15
- Water extraction infrastructure, pump station, offstream storage; 4

It is likely that as cotton growth and harvesting is directly followed by ginning, there is potential for some workers to be employed by both operations. Some work will be performed by contractors (e.g. harvesting, haulage) who will initially likely be sourced external to the region but it is anticipated that a local support industry will develop once this project is operational and other farms develop.

Servicing and maintenance of farm equipment and machinery will be of sufficient scale to warrant local trained staff. The haulage component related to cotton transport to port will be significant. As water availability and cropped area will vary over time, the workforce requirement will similarly vary.

3.9. Economic Indicators

The estimated capital and operational cost of the various components is provided in Table 2. This is at concept phase order of accuracy and is based on anticipated peak operation levels. The figures will be subject to further modelling and analysis as the design process is progressed.

Table 2: Estimated Costs (Preliminary)

	Capital cost (\$M)	Operational cost (\$M/a)
Water extraction infrastructure (weir or diversion)	35	0.5
Pump station and channel	75	2.0
Offstream storage	67	0.9
Farm (including landing strip)	60	13.5
Ancillary	5	0.3
Ginnery	18	7.1

The farm area will replace what is currently cattle grazing country. As such any cost benefit analysis must take this into account. However a major benefit of the project is the additional beef cattle production related to the availability of the cotton seed as supplemental dry season feed. This benefit far outweighs the production lost from native pasture grazing alone. Approximately 55% of the weight of harvested cotton consists of seed; 35% consists of lint (the fibre from which cotton is spun) and 10% consists of waste or trash (twigs, leaves, dirt etc.). Stanbroke estimates that beef production lost to the cotton farm area equates to approximately 150,000 kg per annum whereas that generated by the cotton seed equates to up to 4,000,000 kg per annum.

Cotton seed is also commonly used to produce oil which is then used in a range of production processes, including biodiesel, plastics and cosmetics.

Revenue from cotton at full production and assuming \$500/bale and 14,000ha cropped, is approximately \$61 M per annum. Revenue from additional cattle production is approximately \$8 M.

Flow on employment effects are related to construction of necessary pre-fabricated metal components of the water extraction system and on farm (gantries, bridges, pipes, valves, meters), reinforcing steel, provision of pumps and diesel engines, fuel tanks, generators, sheds, road base, culverts, worker accommodation buildings, waste disposal and so on.

Flow on from farm operations relates to all contractors and providers (e.g. crop dusting, agricultural chemical supply, harvesting and haulage). Similarly the additional port throughput of cotton will generate employment.

TRIP will constitute about 2.4% of the Australian cotton industry based on hectares available to plant (Cotton Australia 2012). As such, it could potentially increase exports by the same amount. At peak

production and pricing, the export value of Australian cotton reaches over \$3 billion. Australia is the fourth largest exporter of cotton in the world (behind USA, India and Uzbekistan) and over 75% of Australia's cotton is sold to China. Cotton seed is also exported to South East Asia and the United States though Stanbroke plans to use its seed locally.

The greater turn-out of beef cattle will provide substantial flow on related to transport, export through ports (either as live export or processed product), feed-lotting to finish off, processing and distribution of packaged products. While Stanbroke currently operates its own feed lot in Chinchilla and meat processing facility in South East Queensland, a local abattoir has been suggested for the Gulf country and some of the production may pass through that facility. Stanbroke currently exports approximately 80% of its beef production so TRIP will potentially increase such exports by approximately 3.2 million tonnes per annum.

Capital and operational costs will be further refined as the project elements are developed.

3.10. Project Financing

The project will be financed by the proponent from its own resources and through borrowing.

4. LOCATION OF KEY PROJECT ELEMENTS

4.1. Location

The irrigation area is on the property Glenore (lot 1 LA2) some 90 km south of Normanton, within Carpentaria Shire. The proposed water extraction infrastructure is adjacent to the irrigation area. The ginnyery will be located near the farming area and Iffley Road on Stanbroke land (if it can be based locally). Other than the water extraction infrastructure and river pump station, which are on unallocated state land, the permanent infrastructure will be developed on pastoral lease land. Stanbroke is independently assessing conversion to freehold.

The Project site and anticipated project elements are illustrated in Figure 1 and Figure 2. These will be located on the eastern side of the Flinders River on Glenore, however some ancillary infrastructure and access tracks may be required on the west, within Stradbroke's Warren Vale property.

Project elements are summarised in Table 3, in comparison to the entire Glenore holding and the wider Flinders catchment. The Flinders catchment is illustrated in Figure 5.

Table 3: Project Elements

Project element	Area ha
Water extraction infrastructure and associated construction elements	4
Inundation at full supply level (FSL) if a weir is constructed	90
River pump station and connecting channel	3
Offstream storage area	2175
Cotton irrigation fields, roads, bunds, associated storage and infrastructure, landing strip	18,000
Ginnyery	150
Total Project Area	20,422
Total Area of Glenore holding	234,000
Total Area of the Flinders River Catchment	10,940,000

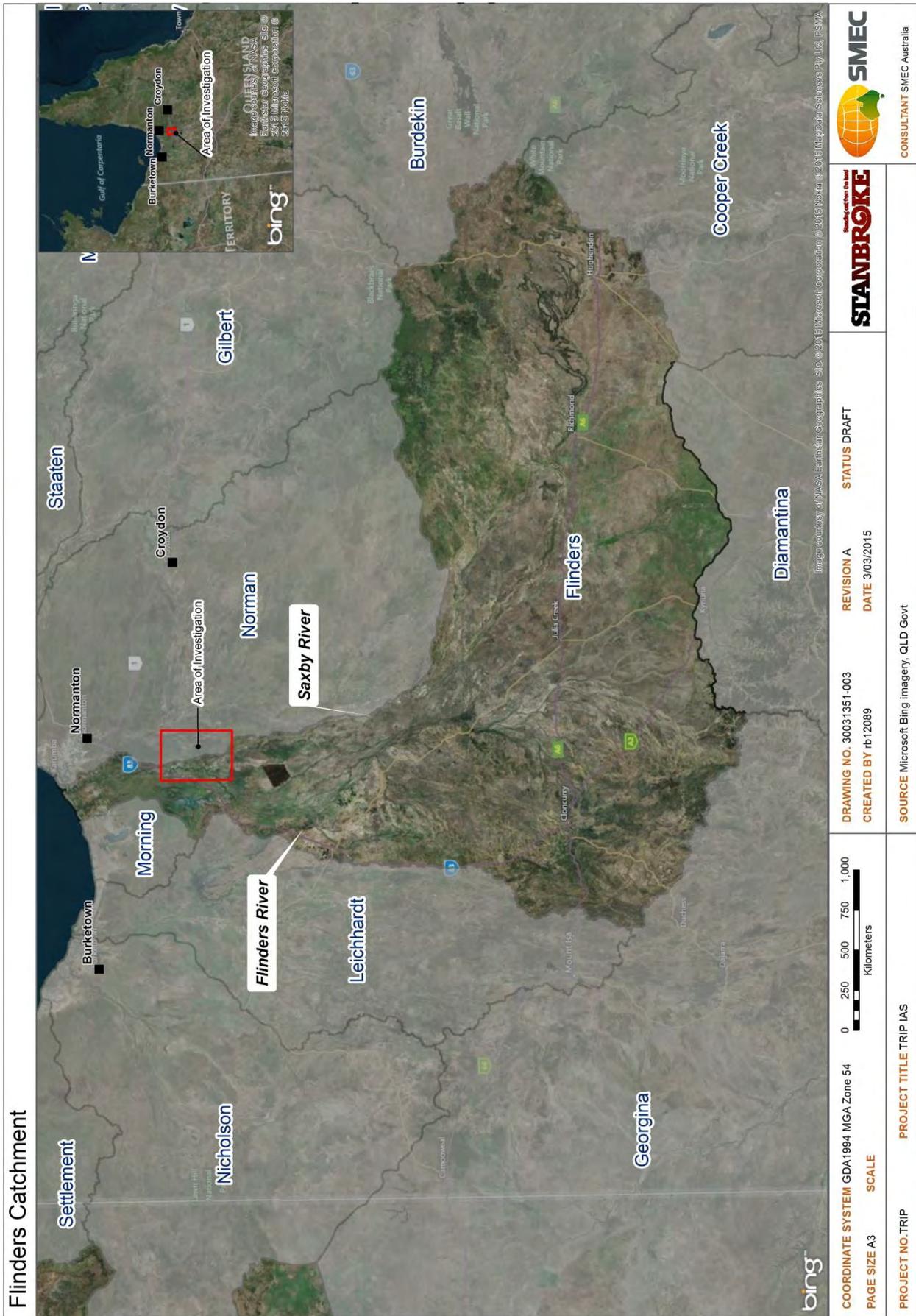


Figure 5: The Flinders Catchment

4.2. Tenure

The Glenore holding encompasses lot 1 LA2, also named as 'Clarina'. It also abuts 'Warren Vale', lot 59 SK3, on the western bank of the Flinders River. The project site is located on the western portion of lot 1 LA2, as shown in

Figure 6. No easements for other infrastructure were identified.

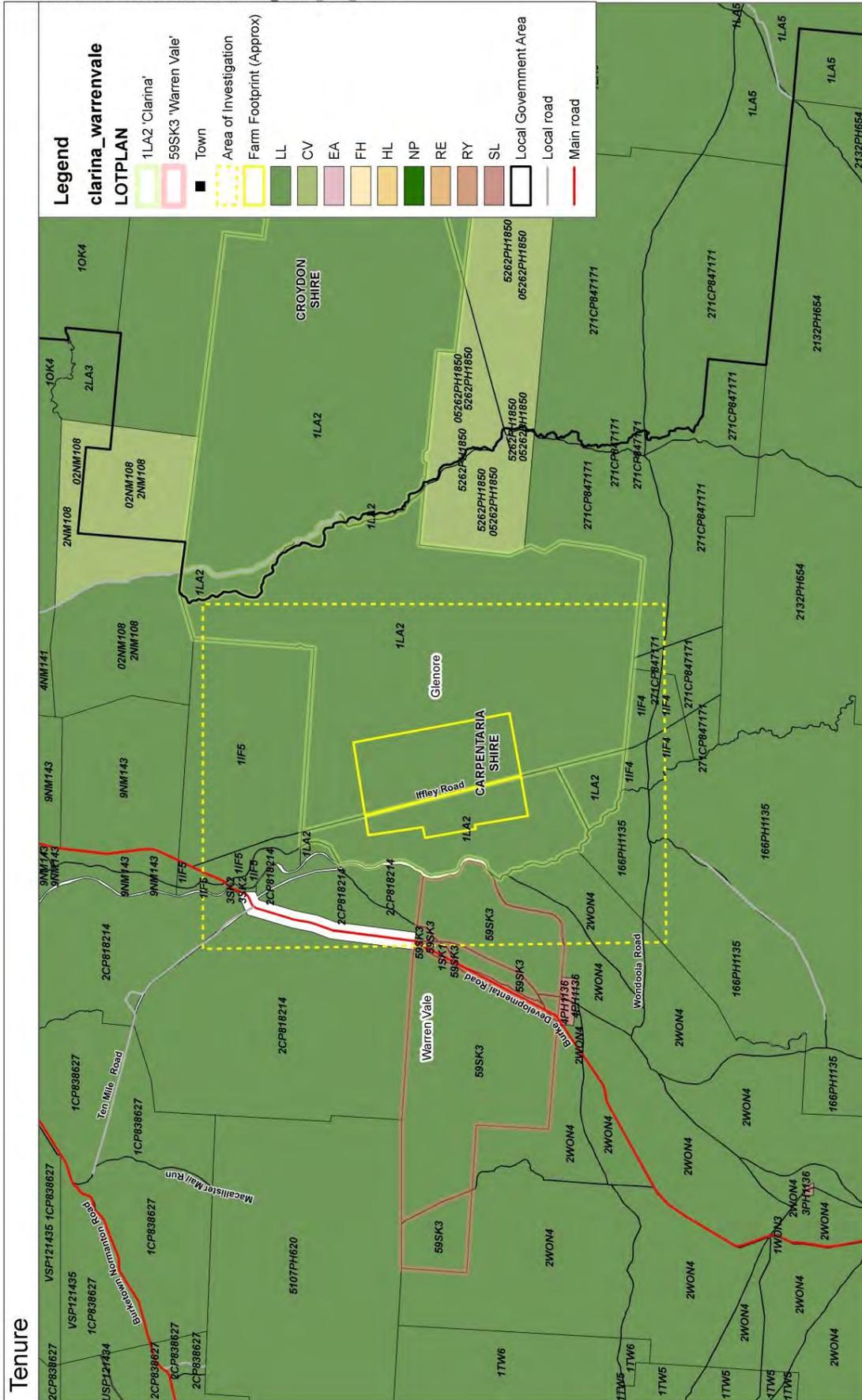
The tenure of both properties is Lands Lease (LL), pastoral lease.

The Flinders River is Unallocated State Land (USL).

Iffley Road is a local government road within the Carpentaria Shire Council local government area. It services rural properties to the south of the Project and connects to the Burke Developmental Road approximately 20 km to the north.

An exploration permit for minerals other than coal (permit no 19155) is located approximately 5 km to the south of the project site.

No key resource areas or haulage routes are located in proximity to the project area.



Tenure

Legend

clarina_warrenvale LOTPLAN

- 1LA2 'Clarina'
- 59SK3 'Warren Vale'
- Town
- Area of Investigation
- Farm Footprint (Approx)
- LL
- CV
- EA
- FH
- HL
- NP
- RE
- RY
- SL
- Local Government Area
- Local road
- Main road

 CONSULTANT SMEC Australia	
	STATUS DRAFT
DRAWING NO. 30031351-006 CREATED BY rb12089	REVISION A DATE 10/03/2015
SOURCE Microsoft Bing imagery, QLD Govt	
COORDINATE SYSTEM GDA1994 MGA Zone 54 PAGE SIZE A3 SCALE 1:370,180	PROJECT TITLE TRIP IAS

Figure 6: Tenure

5. DESCRIPTION OF THE EXISTING ENVIRONMENT

5.1. Natural Environment

5.1.1. Land

The project site is located within the Flinders River catchment in the Gulf Plains Bioregion.

Topography

The topography of the site is generally flat, with a gradual slope to the west towards the Flinders River and north toward the river mouth. Part of the property drains to the Norman River catchment. The farm and offstream storage site is located on land varying from 23 m AHD to 20 m AHD.

Geology

The geology of the project area consists largely of poorly consolidated sediments, with alluvium expected to be encountered around the river and terraces.

Soils

The project area is predominantly within Land Zone 3, classified as

Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave built lunettes. Excludes colluvial deposits such as talus slopes and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols; also with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas (Wilson and Taylor 2012)

This includes a considerable expanse described as 'broad, tertiary clay plains, with brown cracking clay soils' ('black soils'). The Australian Soil Classification in ASRIS (Level 4) indicates the soils of the project area are classified as Vertosols – 'clay soils with shrink-swell properties that exhibit strong cracking when dry and at depth have slickensides and/or lenticular structural aggregates' (Australian Soil Classification, CSIRO http://www.clw.csiro.au/aclep/asc_re_on_line/ve/vertsols.htm)

Preliminary geotechnical investigations undertaken in the vicinity of potential weir sites suggest the floodplains comprise alluvial deposits (sands and silty sands), but possibly principally silty clay. Surficial clayey deposits were dry at the time of investigations, with cracking in excess of 1 m observed.

In terms of agricultural suitability, Petheram *et al.* (2013) nominates 'more than 8 million ha of the Flinders catchment as moderately suitable for a wide range of crops and irrigation methods.' The project area is predominantly mapped as 'Agricultural Land Class A' and is also identified as an Important Agricultural area in the Queensland State Planning Policy Mapping.

The Project area is not expected to be within an area of Acid Sulfate Soil risk. According to mapping within the Carpentaria Planning Scheme (ASS overlay map) Acid Sulfate Soils and Acid Sulfate Soils risk areas are located well to the north of the project area.

CSIRO also noted that the area with highest risk of secondary (irrigation induced) salinity was the Rolling Downs in the central part of the catchment. TRIP is not in that area but is adjacent to the river on alluvium, the area identified by CSIRO as at least risk of secondary salinity.

5.1.2. Water

The project site is located on the eastern side of the Lower Flinders River and tributaries of the Norman River (Brown Creek) are approximately 10 km to the east of the site. The Flinders, Saxby and Cloncurry Rivers converge above the TRIP site and flow as the Flinders River north to the Gulf of

Carpentaria. The Flinders River Catchment covers approximately 109,400 km² (<http://www.track.org.au/catchments/flinders>).

Waterways of the region are known as ‘dryland tropical rivers’ with distinct but relatively short periods of flow.

Flows in the Flinders River catchment are characterised by the dry (May to October) season and the wet (November to April) season within which approximately 88% of rainfall occurs, with January and February traditionally the wettest months. The CSIRO studies highlight that flows in the river are ‘peaky’ with much of the flow occurring in short periods, though during these periods the river regularly breaks its banks. Mean annual evaporation significantly exceeds rainfall and there is no connection to groundwater in the area (Petheram *et al.* 2013) so the river ceases to flow for over 60% of the time.

The median annual flow at different locations within the catchment is shown in Figure 7. Median annual flow at Walkers Bend, just downstream from the Project, is 1241 GL (1,241,000 ML) while that at Richmond is 143 GL, Cloncurry 162 GL and at Julia Creek just three GL.

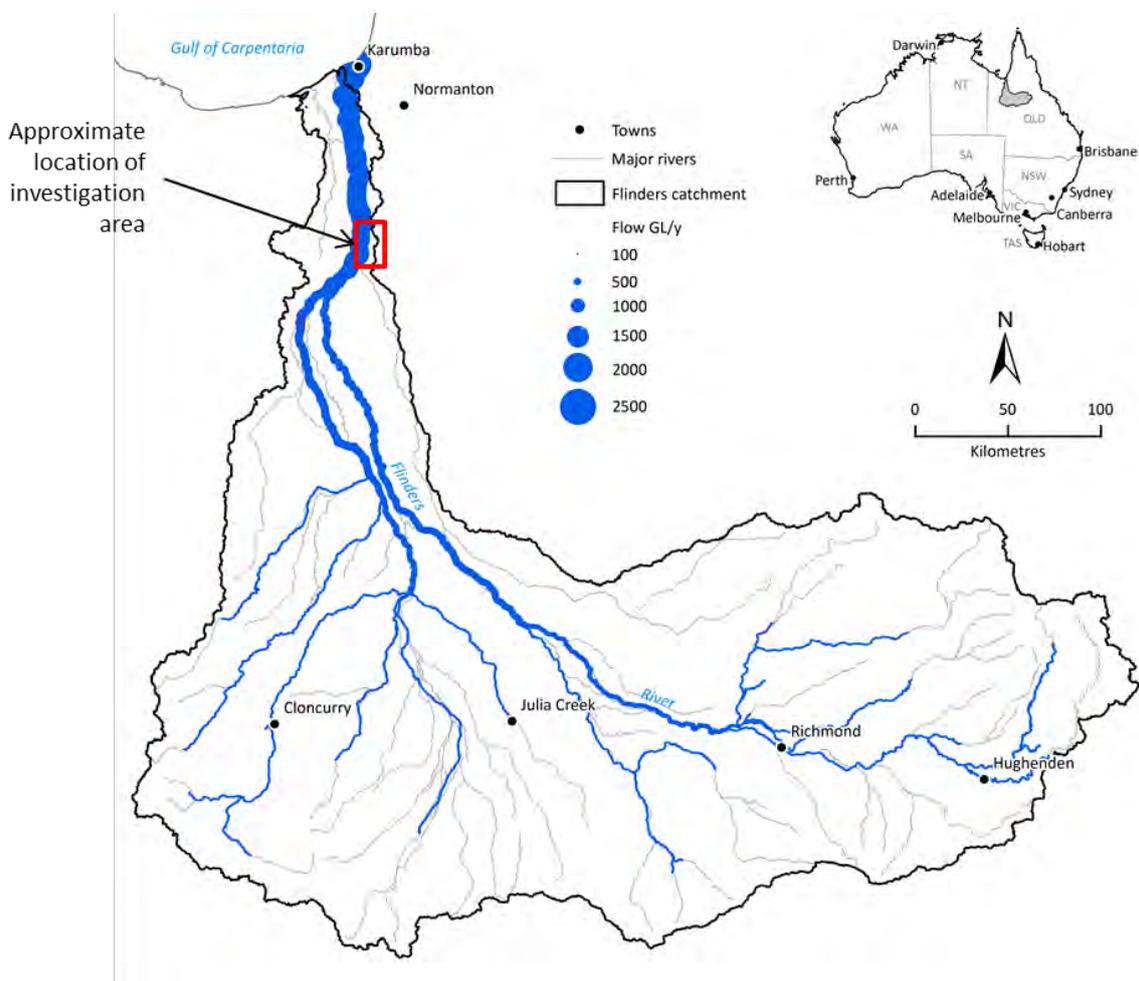


Figure 7: Median Annual Flow

(Source: ARA for the Flinders Catchment, Chapter 3 Figure 3.37 Median annual streamflow (i.e. 50% exceedance) in the Flinders catchment under Scenario A)

A number of named waterholes are mapped along the Flinders River, indicating residual pools that tend to persist for longer than the seasonal flows in the river. This includes Woolshed Waterhole and Twelve Mile Waterhole, both within approximately 1 km of the proposed farm boundary. These are shown in Figure 8.

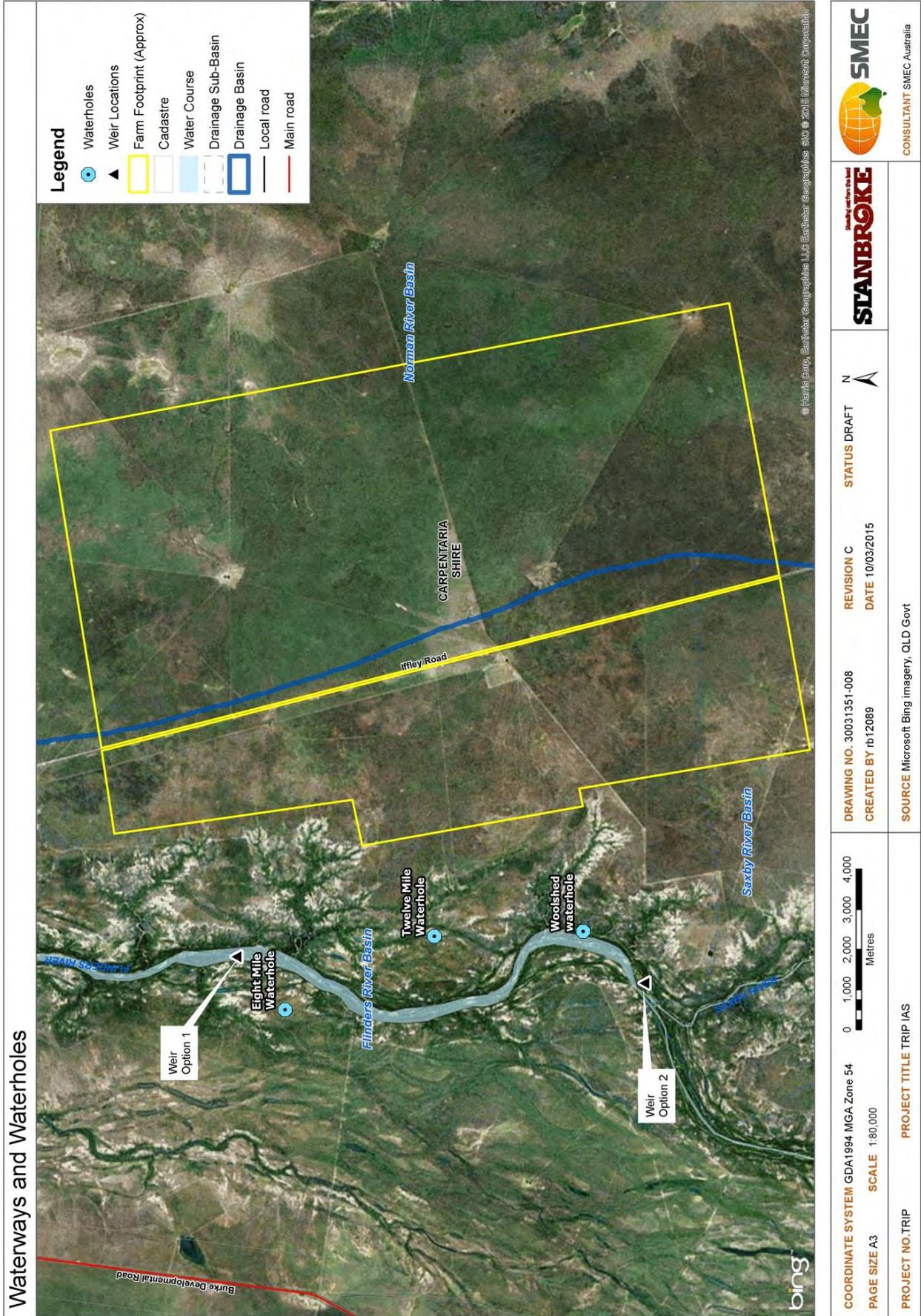


Figure 8 Waterways and Waterholes

The channels of the Flinders River are mapped as “major impact” (purple) for waterway barrier works, in the Department of Agriculture, Forestry and Fisheries (DAFF) spatial data layer Queensland Waterways for Waterway Barrier Works, indicating fish passage is a significant consideration for the river.

Three causeway weirs exist downstream near Walkers Bend and on the Bynoe River and Little Bynoe River (both distributary channels of the Flinders). Two have recently had fishways retrofitted (DPIF, 2005).

5.1.3. Air and Emissions

Air quality in the project area is expected to be primarily influenced by natural processes, including wind, wildfire, and rain. The nearest established or historic monitoring locations identified were at Port Karumba and Mt Isa, areas which are both influenced by industry and/or resource activities and are not representative of the local environment.

The nearest sensitive receptors to the site include the Normanton township, approximately 90 km to the north, and the Warren Vale homestead, approximately 8 km to the west of the project area.

Cattle grazing in the project area and wider region has the potential to adversely impact local and regional air quality, particularly in the dry season, where grass cover may be reduced or when cattle are concentrated at watering points, yards or during mustering. Greenhouse gas emissions generated by current land uses would include cattle and natural biological processes across the landscape plus fuel burning by farm machinery and cattle transport vehicles.

5.1.4. Ecosystems

Aquatic ecosystems

The seasonal flows in the catchment are highly influential on the aquatic habitats and ecology of these waterways. The variability between peak flows and conditions in the dry, increases the importance of waterholes as refugia, for fish, birds, amphibians, reptiles, crustaceans and other native fauna. These refuge waterholes provide water for survival or completion of life cycle stages (Petheram *et al.*, 2013) and are therefore significant for the bio-region.

A major difference between waterholes in the Flinders and those in the Gilbert system, is that there is no connection with groundwater in the Flinders. As such the waterholes rely solely on rainfall and river flow so are less permanent and more turbid and this leads to a substantial difference in ecology. For example Flinders River waterholes are generally too turbid to sustain significant algal or macrophyte growth.

Despite the limited extent of perennial habitat in the Flinders River system, it supports a diverse freshwater fish assemblage due to historic connection to the large Lake Carpentaria drainage system. The freshwater fish assemblage is notable in the high proportion of diadromous species, which require access to marine habitats to complete their life histories.

Petheram *et al.* (2013) indicates 50 fish species are known to occur in the Flinders catchment, with species diversity and numbers decreasing with distance from the coast. There are a number of waterway barriers in the catchment considered likely to impede fish movement. This includes four causeway weirs located downstream of the project area on the Flinders, Bynoe and Little Bynoe rivers. These waterway barriers were assessed by DPIF (now DAF; Marsden and Stewart 2005) as barriers to fish movement, except in times of significant flows. Recent inspection showed fishways had been retrofitted at two of these sites.

Petheram *et al.* (2013) notes there are three key species that should be considered when determining fish passage requirements. These are Barramundi, Freshwater sawfish and Freshwater whipray.

Barramundi are known to breed in tidal and estuarine waters, with both adults and juveniles returning to upstream environs (Petheram *et al.* 2013). Stocking of these species in upstream impoundments (Lake Fred Tritton in Richmond, Chinaman Creek Dam and Lake Corella near Cloncurry) may have influenced this species' natural distribution but their presence throughout the catchment is considered an indicator of 'the connectivity that currently exists in the Flinders catchment for fish passage' (Petheram *et al.*, 2013).

Marine ecosystems

The project area is located approximately 100 km upstream of the coastline, where the Flinders River enters the Gulf of Carpentaria. The tidal extents of the river are approximately 75 km downstream of the project area. The estuarine extents of the Flinders River are within the Morning Inlet- Bynoe River Declared Fish Habitat Area (FHA-062), shown in Figure 9. Habitat values of the area include mangrove communities, and 'extensive unvegetated salt flats associated with the estuary and foreshore sand banks' (NPRSR, 2012). The area is recognised for its importance as a fish nursery, with a long term seagrass monitoring program (by Ports North, James Cook University and Trop Water) documenting the resilience and distribution of seagrass in the vicinity. The March 2014 summary report indicates that seagrasses in the Gulf of Carpentaria were 'generally in a good condition which is in stark contrast to seagrasses on the east coast of Queensland that were severely impacted by unfavourable climate events and cyclones and remained in a vulnerable condition in 2013/14' (Trop Water, 2014).

The Southern Gulf Aggregation (part of which is shown in Figure 9) is listed in the Directly of Important Wetlands in Australia (as Qld 114). It is the largest continuous estuarine wetland aggregation of its type in northern Australia, comprising some 545,577ha and covering the shore area associated with all rivers in the Gulf WRP area. It is one of the three most important areas for shorebirds in Australia (Watkins 1993).

The Commonwealth listed North Marine Region commences three nautical miles off the coast, beyond State waters.

Terrestrial

The majority of the project area and surrounding environment is mapped under the Queensland Globe, the Department of Environment and Heritage Protection (DEHP) and DNRM as containing remnant Regional Ecosystems (RE). Regional ecosystems and other environmental features are illustrated on Figure 10.

All of the vegetation communities are on land zones 3 and 5. These are described as recent Quaternary alluvial systems and Tertiary-early Quaternary loamy and sandy plains and plateaus, respectively.

Following a literature and database search, dry season (November 2014) and post wet season (May 2015) floristic surveys have been undertaken. The area surveyed included the downstream weir and farming area option. A total of 225 floristic survey sites were investigated during the course of the survey with seven REs identified and mapped (Table 4). All are listed as Least Concern under the Vegetation Management Act (VM Act).

No Threatened Ecological Communities (TECs) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded or expected.

There is no potential to impact flora related Matters of National Environmental Significance (MNES) although the following Matters of State Environmental Significance (MSES) are likely to be impacted during project development:

- Wetland habitats (RE2.3.16a).
- Riparian vegetation associated with Order 1 – 4 watercourses.

Native grasslands within RE2.3.4 are dominant in the potential agricultural area.

Depending on the water infrastructure extraction and farm site finally selected, the project may include other terrestrial vegetation communities.

The presence of wetland vegetation across the wider project area indicates that flooding and inundation is a seasonal occurrence though the Department of Science, Information Technology and Innovation (DSITIA (2014)) noted that floodplain inundation did not occur at all in the Walkers Bend assessment area in approximately 43% of years.

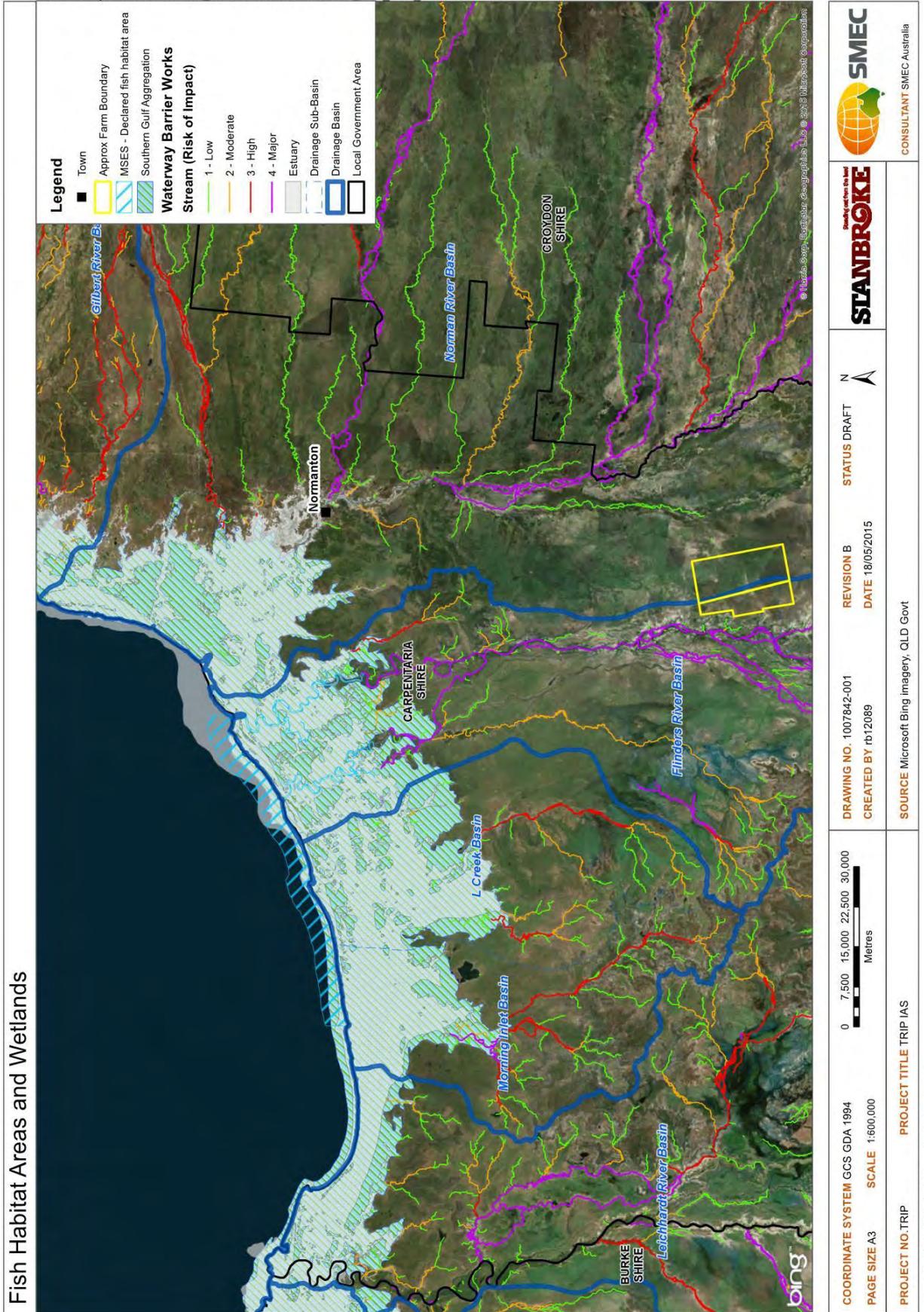


Figure 9: Morning Inlet- Bynoe River Declared Fish Habitat Area (FHA-062)

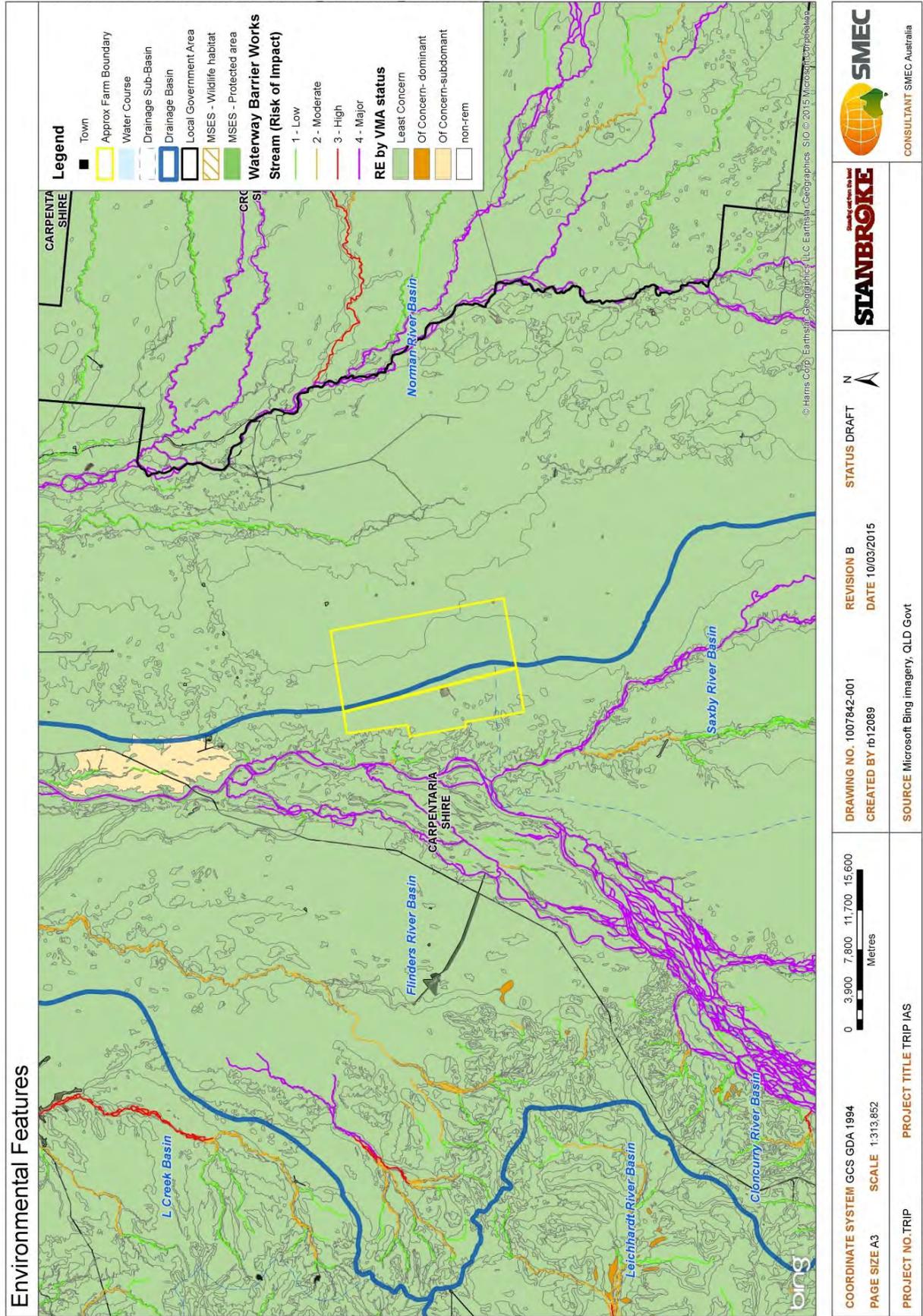


Figure 10: Environmental Features

Table 4: Regional Ecosystems Identified During Field Survey

Regional Ecosystem	Sub-type	Description (EHP DSITIA 2014)	Description (Field Survey)	VM Status
2.3.4	2.3.4x46c	Mixed tussock grassland, including combinations of the species <i>Eulalia aurea</i> , <i>Dichanthium spp.</i> , <i>Chrysopogon fallax</i> , <i>Aristida latifolia</i> , <i>Iseilema spp.</i> , <i>Astrebla spp.</i> <i>Panicum decompositum</i> and <i>Ophiuros exaltatus</i> .	<i>Dicanthium sericeum</i> , <i>Astrebla lappacea</i> , <i>Astrebla squarrosa</i> , <i>Aristida spp.</i> , <i>Chrysopogon fallax</i> dominant native grassland.	Least Concern
2.3.11		<i>Eucalyptus microtheca</i> , <i>Excoecaria parvifolia</i> low open woodland and <i>Dichanthium spp.</i> on grey clay plains.	<i>Eucalyptus microtheca</i> dominant low open woodland, woodland and occasional open forest. Includes scalds within these woodlands often devoid of vegetation.	Least Concern
2.3.16	2.3.16c	Palustrine wetland (e.g. vegetated swamp). Billabongs (abandoned channels) on alluvial plains, commonly fringed with <i>Eucalyptus camaldulensis</i> and/or <i>E. microtheca</i> and, occasionally, <i>Melaleuca spp.</i>	Palustrine wetland - floodplain overflow generally fringed by open forest of <i>Eucalyptus microtheca</i> .	Least Concern
2.3.17	2.3.17f	Riverine wetland or fringing riverine wetland. <i>Eucalyptus microtheca</i> woodland to open forest, commonly with <i>Terminalia platyphylla</i> .	<i>Eucalyptus microtheca</i> dominated woodland and open forest on upper banks of major watercourses	Least Concern
2.3.18	2.3.18a 2.3.18x1a	<i>Atalaya hemiglauca</i> and <i>Grevillea striata</i> low woodland on low rises and plains on red loamy soils. Mixed woodland to open woodland with combinations of the species <i>Corymbia terminalis</i> , <i>C. bella</i> , <i>C. aparrerinja</i> , <i>Lysiphyllum cunninghamii</i> , <i>E. microtheca</i> , <i>Acacia cambagei</i> and <i>Grevillea striata</i> .	Low woodland with dominant <i>Atalaya hemiglauca</i> Woodland with dominant <i>Corymbia bella</i> , <i>Lysiphyllum cunninghamii</i> , <i>Atalaya hemiglauca</i> , <i>Flueggea virosa</i>	Least Concern
2.3.24		<i>Melaleuca spp.</i> woodland-open forest on sands in channels and on levees.	Open forest with <i>Melaleuca fluviatilis</i> +/- <i>Eucalyptus microtheca</i> on braided drainage channels	Least Concern
2.5.1	2.5.1b	Mixed low woodland to woodland, with combinations of the species <i>Lysiphyllum cunninghamii</i> , <i>Terminalia spp.</i> , <i>Erythrophleum chlorostachys</i> , <i>Melaleuca nervosa</i> and <i>Corymbia confertiflora</i> . <i>Atalaya hemiglauca</i> , <i>Acacia platycarpa</i> , <i>Ventilago viminalis</i> and <i>Grevillea parallela</i> occasionally occur in the canopy.	Low woodland and open forest with <i>Grevillea striata</i> , <i>Lysiphyllum cunninghamii</i> , <i>Ventilago viminalis</i> and <i>Atalaya hemiglauca</i> .	Least Concern

5.1.5. Flora and Fauna Species

There are no records of listed invertebrate, macrophyte, frog, monitor or turtle species from the catchment. Both freshwater (*Crocodylus johnstoni*) and estuarine (*C. porosus*) crocodiles are known from the catchment, and both are EPBC Act-listed (as migratory or marine) and the estuarine crocodile is listed as Vulnerable under the *Nature Conservation Act 1992 (NC Act)*. Freshwater crocodile densities were observed to have been high during a preliminary field inspection conducted in November 2014.

The aquatic fauna is notable for supporting a large elasmobranch species, the large-toothed (or Freshwater) sawfish *Pristis pristis* (EPBC listed as vulnerable). There is a single confirmed record of the species (2004) from the Walker's Bend pool downstream of the project area, and a number of unconfirmed records exist upstream. This large bodied species requires large perennial habitats to maintain resident populations, and requires passage past potential movement barriers that are appropriate for fish of that size. Potential impact on the species is addressed in Section 6.6.2.

The terrestrial flora surveys recorded:

- A total of 97 flora species during the dry season. The number added by the post wet season survey has not yet been confirmed.
- No flora species listed under either the NC Act or EPBC Act as threatened (Endangered, Vulnerable or Near Threatened). There is limited potential for two species, *Oldenlandia spathulata* and *Sesbania erubescens* (Endangered and Near Threatened under the NC Act) to occur.
- Three exotic species listed as Class 2 weeds under the LP Act. These are rubber vine, parkinsonia and prickly acacia.

A review of online databases was undertaken with respect to terrestrial fauna and identified seven threatened species (six birds and one reptile) which may be present in the project area. An assessment of the likelihood of them occurring is presented in Table 5. NRA ecology consultants conducted a dry season terrestrial fauna survey in early November 2014 and a specific migratory bird survey in April 2015. Neither survey detected any threatened species. A post wet season survey is planned.

Table 5: Likelihood of Occurrence of Threatened terrestrial Fauna Species in the Project Area

Scientific Name	Common Name	Status ¹		Species Description and Likelihood of Occurrence
		EPBC Act	NC Act	
<i>Erythrotriorchis radiatus</i>	Red Goshawk	V	E	<p>Red Goshawks occur across coastal and subcoastal northern (Kimberley Division of Western Australia to the Top end of Northern Territory and North-west Highlands of Queensland) and eastern Australia (Cape York to south-east Queensland). It is occasionally recorded (mainly from gorge country) in central Australia and western Queensland (Czechura 2012).</p> <p>The preferred habitat for the Red Goshawk is open forest and woodland that support a mosaic of vegetation types (Czechura 2012; Garnett <i>et al.</i> 2011). Nesting usually occurs in tall (> 20 m) emergent trees that are near (< 1 km) to permanent freshwater (streams and wetlands) (Aumann & Baker-Gabb 1991). It mainly preys on medium to large birds (waterfowl, parrots, pigeons, kookaburras and large passerines), and rarely takes mammals, reptiles and small animals. Limited data are available on movements, though studies in the Northern Territory recorded a breeding female ranging 5 km to 7 km from its nest. In the non-breeding season the adult male usually ranged 8 km to 8.5 km from the nest, and frequently >10 km from the nest (and outside the telemetry signal range) (Czechura 2012).</p> <p>Information relating to the presence of Red Goshawks in the Gulf Plains Bioregion is unresolved. Czechura and Hobson (2000; <i>in</i>: DERM 2012) concluded that the Gulf Plains do not appear to be suitable for Red Goshawks, but because of the presence of localised suitable habitat (the lower Leichhardt River), it is possible that the species may be present in small numbers. It has also been described as ‘apparently absent from the Gulf Plains’ (Czechura 2012). The Atlas Of Living Australia database shows two sighting records of this species along the Leichardt River approximately 100 km west and 150 km south-west of the Three Rivers Irrigation Project area. These sighting records occur in landscape similar to that which occurs on and near the Three Rivers Irrigation Project area.</p> <p>On available information Red Goshawks may occur in the Three Rivers Irrigation Project area, though their presence is likely to be sporadic and the species is unlikely to breed in this area.</p>
<i>Geophaps scripta scripta</i>	Squatter Pigeon (Southern Subspecies)	V	V	<p>Central Queensland is the northern-most occurrence of the Southern Subspecies of Squatter Pigeon (Higgins and Davies 1996). The Northern Subspecies of Squatter Pigeon (<i>G. s. peninsulae</i>) occurs from central Queensland north to Cape York Peninsula and parts of the Gulf Plains (Higgins and Davies 1996). The Northern Subspecies is not listed as a threatened species under the NC Act or EPBC Act.</p>

Scientific Name	Common Name	Status ¹		Species Description and Likelihood of Occurrence
		EPBC Act	NC Act	
				The Southern Subspecies of Squatter Pigeon is unlikely to occur in the Project area.
<i>Erythrura gouldiae</i>	Gouldian Finch	E	E	<p>The Gouldian Finch formerly ranged throughout the tropical savannas of northern Australia (Maute & Legge 2012) though currently the species is only found in significant numbers (>50 adult birds) at five locations in Western Australia and five locations in the Northern Territory (O'Malley 2006). Breeding populations in Queensland have not been observed in recent decades, though small numbers are occasionally seen near Mt Isa, Georgetown and on the Cape York Peninsula (Maute & Legge 2012).</p> <p>The preferred habitat is broadly described as open tropical woodland with a grassy understorey (Maute & Legge 2012). Critical habitat components comprise their favoured annual and perennial grasses (especially Sorghum, <i>Sarga spp.</i> and Spear grasses, <i>Heteropogon spp.</i>), a nearby water source and, in the breeding season, unburnt hollow-bearing Eucalypts (eg Northern Salmon Gum, <i>Eucalyptus tintinnans</i>, Snappy White Gum, <i>E. brevifolia</i> and Snappy Gum, <i>E. leucophloia</i>) (Higgins <i>et al.</i> 2006; O'Malley 2006; Tidemann 1996; Tidemann <i>et al.</i> 1999). At the landscape level, it appears that a combination of rocky hills in proximity to flatter country supporting patches of key wet season grasses is important (O'Malley 2006). Gouldian Finches feed on a restricted range of grass seeds and rarely consume insects or other food (Higgins <i>et al.</i> 2006; O'Malley 2006).</p> <p>Movement patterns apparently vary between localities and years according to conditions. Daily movements may range between <2 km and 17 km (Palmer 2005; O'Malley 2006). Similar variability has been observed with seasonal movement patterns with some populations remaining in their hilly dry season sites year round, while others may disperse up to 10 km to access their wet season sites (Higgins <i>et al.</i> 2006).</p> <p>The Atlas Of Living Australia database shows two sighting records of this species along the Leichardt River approximately 100 km west of the Three Rivers Irrigation Project area, a cluster of sighting records near Normanton (approximately 70 km north of the project area), and 130 km east of the project area near Croydon. Many of these sighting records occur in landscape settings similar to those which occurs on and near the Three Rivers Irrigation Project area.</p> <p>On available information Gouldian Finches may occur in the Three Rivers Irrigation Project area, though their presence is likely to be very sporadic and the species is unlikely to breed in this area.</p>
<i>Psephotus chrysopterygius</i>	Golden-shouldered Parrot	E	E	<p>Golden-shouldered Parrots formerly occurred across most of Cape York Peninsula though are now restricted to two populations in central Cape York Peninsula (Crowley 2012). The species has not been seen in the Normanton district since 1855 (Crowley <i>et al.</i> 2004).</p> <p>On available information Golden-shouldered Parrots are unlikely to occur in the Project area.</p>

Scientific Name	Common Name	Status ¹		Species Description and Likelihood of Occurrence
		EPBC Act	NC Act	
<i>Rostratula australis</i>	Australian Painted Snipe	E+M	V	<p>Australian Painted Snipes are patchily distributed across northern and eastern Australia, with scattered records from central and south-western Australia (Barrett <i>et al.</i> 2003; Garnett <i>et al.</i> 2011). The species' distribution and ecology is poorly known largely because they are cryptic in behaviour and highly nomadic in their movements. When breeding, these birds prefer temporary freshwater or brackish wetlands with low vegetation (avoiding tall dense reeds) during the flush of productivity that follows recent flooding by fresh water (Tzaros <i>et al.</i> 2012). Their habitat preferences are less specialised during the non-breeding period occurring in recently flooded temporary wetlands, and various other fresh to slightly brackish wetlands (Tzaros <i>et al.</i> 2012). May also occasionally use artificial habitats such as reservoirs, farm dams, sewage ponds, inundated grassland and irrigation channels (Tzaros <i>et al.</i> 2012; Marchant & Higgins 1993).</p> <p>According to the Atlas of Living Australia database there are only two species records in the northern Gulf Plains. The nearest record to the Three Rivers Irrigation Project area occurs approximately 45 km to the north-north-west of the project area. The northern Gulf Plains region appears to contain large areas of suitable habitat and the species may be more widely distributed and common in this area than the data suggests.</p> <p>Australian Painted Snipes are likely to occur in the Three Rivers Irrigation Project area on at least a temporary basis. The presence of suitable breeding habitat in this area is unknown.</p>
<i>Tyto novaehollandiae kimberli</i>	Masked Owl (Northern Subspecies)	V	V	<p>Masked Owls have been recorded in a variety of habitats including riverside forests, rainforest, open forest, paperbark swamps, and the along the margins of grasslands, mangroves and sugar cane fields (Garnett <i>et al.</i> 2011; Debus 2012). The species nests in tree hollows. Its preferred prey is small to medium sized mammals, though will also feed on insects and other small vertebrates (Higgins 1999; Garnett <i>et al.</i> 2011; Debus 2012).</p> <p>The distribution of Masked Owls is imperfectly known with very few records across its broad range (Woinarski 2004). The most recent sighting data and species accounts (<i>e.g.</i> Barret <i>et al.</i> 2003; Garnett <i>et al.</i> 2011; Debus 2012) suggest that the species is absent from the Gulf Plains; however, survey effort in the region is likely to be low.</p> <p>Based on available information, Masked Owls are unlikely to occur in the Project area.</p>

Scientific Name	Common Name	Status ¹		Species Description and Likelihood of Occurrence
		EPBC Act	NC Act	
<i>Crocodylus porosus</i>	Estuarine Crocodile	M	V	<p>In Queensland, Estuarine Crocodiles are usually restricted to coastal waterways and floodplain wetlands. Populations may also be found hundreds of kilometres upstream, such as in the Fitzroy River and the waterways of the southern Gulf of Carpentaria (Read <i>et al.</i> 2004). Preferred nesting habitat of the Estuarine Crocodile includes elevated, isolated freshwater swamps that do not experience the influence of tidal movements (Webb <i>et al.</i> 1987).</p> <p>Based on available information Estuarine Crocodiles are likely to occur in the Three Rivers Irrigation Project area, though primarily during the wet season.</p>

1: Status under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Queensland Nature Conservation Act 1992 (NC Act). Categories are: E – Endangered, V – Vulnerable, M – Migratory, NT – Near Threatened, LC – Least Concern, SLC – Special Least Concern.

In addition, database search results reported 21 Special Least Concern fauna species (all birds) listed under the NC Act, shown in Table 6, alongside their EPBC Act status (migratory and/or marine). Echidna, Platypus and Koala were not returned from searches or detected via field survey.

Non-native fauna recorded were cattle, cat, dingo, goat, pig and cane toad.

Table 6: Special Least Concern Species (NC Act)

Scientific name	Common name	EPBC Status	Observed during 2014 survey or migratory bird survey
<i>Haliaeetus leucogaster</i>	White bellied sea eagle	Marine, Migratory (CAMBA)	Yes
<i>Pandion cristatus</i>	Eastern osprey	Marine, Migratory (Bonn)	
<i>Apus pacificus</i>	Fork tailed swift	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Ardea ibis</i>	Cattle egret	Marine; Migratory (CAMBA, JAMBA)	Yes
<i>Ardea modesta</i>	Eastern great egret	Marine; Migratory (CAMBA, JAMBA)	Yes
<i>Charadrius veredus</i>	Oriental plover	Marine; Migratory (Bonn, JAMBA, ROKAMBA)	
<i>Glareola maldivarum</i>	Oriental pratincole	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Grus antigone</i>	Sarus crane	Migratory (CAMBA)	Yes
<i>Hirundo rustica</i>	Barn Swallow	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Chlidonias leucopterus</i>	White-winged black tern	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Hydroprogne caspia</i>	Caspian tern	Marine; Migratory (CAMBA, JAMBA)	
<i>Sterna dougallii</i>	Roseate tern	Marine; Migratory (JAMBA)	
<i>Sterna hirundo</i>	Common tern	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Merops ornatus</i>	Rainbow bee-eater	Marine; Migratory (JAMBA)	Yes
<i>Rhipidura rufifrons</i>	Rufous fantail	Marine; Migratory (Bonn)	
<i>Actitis hypoleucos</i>	Common sandpiper	Marine; Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	Marine; Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	
<i>Tringa stagnatilis</i>	Marsh sandpiper	Marine; Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	Yes (but not returned in database searches)
<i>Numenius minutus</i>	Little curlew	Marine; Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	
<i>Tringa nebularia</i>	Common greenshank	Marine; Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	Yes
<i>Sula leucogaster</i>	Brown booby	Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	
<i>Plegadis falcinellus</i>	Glossy ibis	Marine; Migratory (Bonn, CAMBA)	Yes

5.2. Social and Economic Environment

5.2.1. Economic and Demographic Characterisation

The following snapshot is based on a review of 2011 Census data for Carpentaria Shire, compared with available data from the *Queensland Regional Profiles: Resident Profile for the Carpentaria Shire Local Government Area*, as at 12 November 2014.

The Project area is located within the Carpentaria Shire. With the majority of the shire under vast pastoral leases, communities and townships are concentrated at Normanton (90 km to the north) and Karumba (100 km to the north). Other nearby townships include Burketown (150 km north west) and Croydon (130 km due east). Carpentaria Shire covers an area of approximately 64,334 km (OESR).

According to the *Queensland Regional Profiles: Resident Profile for the Carpentaria Shire Local Government Area*, as at 30 June 2013, the estimated resident population of the Shire was 2,225 persons. This represents an increase of 757 persons in the Shire since the 2011 Census. However Petheram *et al.* (2013) noted that the population declined by nearly 58% between 2001 and 2011 and this trend was evident in all Gulf shires, though to a lesser extent.

The Carpentaria Shire population is projected to grow at a rate of 0.6% over the next 25 years to 2,536 persons by 2046. By comparison the whole of Queensland population is projected to grow at a rate of 1.9% over the same period, to 7,095,177 persons (OESR).

According to the 2011 Census data, 36.8% of the Shire's population were of Aboriginal and Torres Strait Islander descent, compared to 3.6% of the Queensland population as a whole.

There were 1042 persons reported in the labour force as of the June Quarter, 2014. This is higher than the 616 people reported in the labour force in Normanton (State Suburbs) during the time of the 2011 Census. From the 2011 Census, 72.6% were employed full time, 13.3% were employed part-time and 5.5% were unemployed. The most common occupations in Normanton (State Suburbs) included Labourers 27.2%, Managers 14.5%, Technicians and Trades Workers 12.9%, Professionals 10.2%, and Community and Personal Service Workers 9.8%. The workforce comparison for the whole of Queensland is shown in Figure 11.

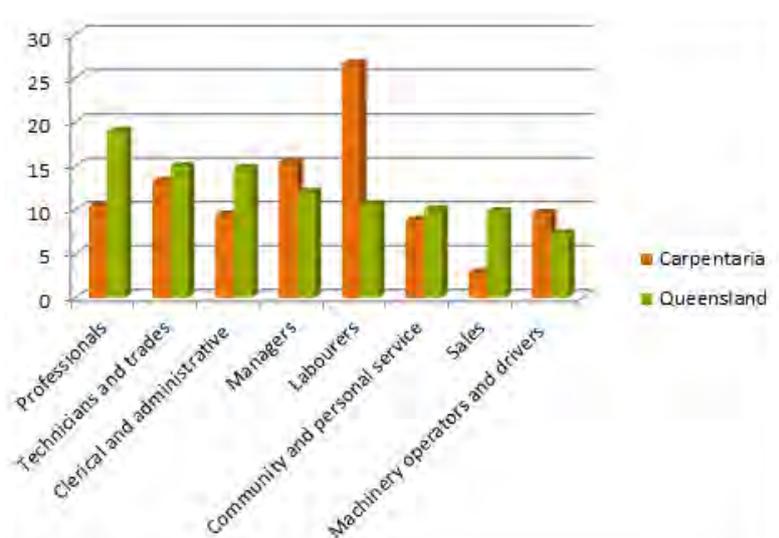


Figure 11: Workforce Comparison

The unemployment rate recorded in the June 2014 Quarter for the Carpentaria Shire was 10.6%, which was considerably higher than the State rate of 6.0% for the same period.

Table 7 provides a comparison between Carpentaria Shire and Queensland by family type per household, based on ABS 2011 Census data. As at 2011, Carpentaria Shire had 643 households, compared to Queensland's 1.5 million households.

Table 7: Household Type

	Couple family no children	Couple family with children	One parent family	Other family	Lone person household	Group household
Carpentaria Shire	32%	24%	9%	1%	31%	3%
Queensland	28%	31%	11%	1%	23%	5%

This table shows Carpentaria has a comparably lower proportion of families with children than the rest of Queensland, and a higher proportion of lone person households.

At the time of the 2011 Census, the median weekly personal income for people aged 15 years and over was \$604 and the median household income was \$1,107.00 per week. The Queensland median was \$587 and \$1,453 respectively, which may indicate a premium wage for remote workers, and confirm the higher proportion of single or smaller person households.

5.2.2. Accommodation and Housing

At the time of the 2011 Census, the region had 407 occupied private dwellings. Of these private dwellings, 322 were separate houses, 11 were semi-detached, 41 were apartments and 31 were other dwellings.

18.7% of homes were fully owned, and 11.1% were in the process of being purchased by home loan mortgage. 60% of homes were rented. The median rent in Normanton in 2011 was recorded at \$110 per week (compared to \$300 a week median rent in Queensland), which increased to \$193 per week in 2014 (median of the 12 months to 30 September 2014). The median mortgage repayment in 2011 was \$953 per month, compared to the median across Queensland of \$1,850.00.

In the year to 30 June 2014, nine approvals for new houses were recorded. State-wide by comparison this figure was at 19,875.

5.2.3. Social and Recreational Services

Normanton has a golf course, swimming pool and recreation facilities including sports grounds, race course, rodeo ground, camp grounds, a tourist park, two hotels and two motels. A bank is also present.

The town has an airport, hospital, childcare centre, state school for Prep to Grade 12 and aged care facilities. Police and Ambulance are located in Normanton with the rural fire service located in Cloncurry. The town caters for tourists, with a number of lodges and motels, restaurants and attractions, such as a giant replica crocodile, the historic railway station and the Gulflander train, which runs on a 150 kilometre line between Normanton and Croydon.

According to the *Queensland Regional Profiles: Resident Profile for the Carpentaria Shire Local Government Area*, as at 31 August 2014, there were five early childhood education and care services in the Carpentaria Shire. The regional profile also reports as of 30 June 2013, there were 20 aged care service operational places within the Shire.

A 'small paved rest area' with sheltered picnic table but no comfort facilities is located on the Burke Development Road, on the west bank of the Flinders River approximately 7 km west of the project area, according to the Queensland Government road amenities dataset (Qld Globe).

The project area is located within approximately 1-2 hours' drive of community services and facilities.

5.2.4. Cultural Heritage

5.2.4.1. Indigenous

Aboriginal Cultural Heritage is recognised, protected and conserved under the provisions of the *Aboriginal Cultural Heritage Act 2003*, which is administered by the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA).

A search of the DATSIMA Cultural Heritage Database and Register was undertaken. No Aboriginal cultural heritage places have been recorded on Lot 1 LA2 or within 250 m of the boundary of this lot. However, as advised by DATSIMA, this lack of registered records does not confirm the absence of heritage places, as it may reflect a lack of previous heritage surveys within the area.

5.2.4.2. Non-indigenous

The Queensland Heritage Act 1992 provides for the conservation of Queensland's cultural (non-indigenous) heritage. No recorded places were identified within close proximity to Lot 1 LA2 (i.e. that have achieved registration under the provisions of the *Queensland Heritage Act 1992*). The nearest heritage place identified was Burke and Wills' Camp B/CXIX and Walkers Camp on the Little Bynoe River (State Heritage Place), approximately 40 km north (downstream) of the project area. The site consists of a Blazed tree/Dig tree/Marker tree and Memorial/Monument. Records show that the Burke and Wills Expedition likely followed the Flinders River from Corella Creek, the Cloncurry River and then along the Flinders River to the camp site (Leahy, 2011). Other heritage features are located in the Normanton township.

A search of the Australian Heritage Register was also undertaken. There are no places of heritage significance recorded within close proximity to Lot 1 LA2. The nearest heritage place listed on the Australian Heritage Register is in the Normanton township.

5.3. Built Environment

5.3.1. Infrastructure

There are no water or wastewater utilities servicing the site. Power supply is low voltage. Mobile phone coverage is limited to Normanton and surrounds and other localities. The nearest dwelling place is the homestead located on the Warren Vale holding, approximately 8 km to the west of the project area.

Existing improvements within the project area include localised small water storages, access tracks, yards and storage sheds. Depending on the final location of the farming area, yards and sheds may not be impacted.

River gauging stations are located on the Flinders River, with the closest located approximately 11 km downstream of the northern-most proposed weir site, at the Burke Developmental Road crossing or Walkers Bend site.

No other services or utilities are known in the vicinity of the project area.

5.3.2. Traffic and Transport

The road network is illustrated in Figure 1. Iffley Road traverses the farming area if the downstream site is used while the Burke Development Road is immediately west of Warren Vale and intersects with Iffley Road to the north. No public transport services are provided in the area. The Burke Development Road is a designated 'multi-combination route', for type 1 and type 2 Road trains (including B triples).

Private airfields are located on most properties within the region including Glenore, Warren Vale and Donors Hill. Public airports are located in Normanton and Croydon.

Karumba is an active port linked mainly to mining and marine fisheries.

5.4. Land Use and Tenures

5.4.1. Key Local and Regional Land Uses

The majority of the Carpentaria Shire is zoned rural, with Normanton, Karumba and Karumba Point the key localities within the Shire. Lot 1LA2 is located partially within Carpentaria Shire, with the eastern portion of the holding within Croydon Shire.

The project area is in an area mapped as Agricultural land Class A.

The project area is part of Stanbroke's holdings, utilised for the rearing and grazing of beef cattle for the domestic and international market. The region is dominated by beef cattle production.

The Queensland Agricultural Land audit identifies the project area within an area of 'pasture production' (medium and high) with a small area of 'sown pasture'. The Project area is predominantly classified as Agricultural Land, along with the alluvial plains associated with the Flinders, Saxby and Cloncurry Rivers.

5.4.2. Key Local and Regional Tenures

Figure 6 shows the tenure of the Project area and surrounds. This is predominantly Lease Land, held under pastoral leases.

5.4.3. Native Title

There is currently no registered Cultural Heritage body for the western portion of lot 1LA2, however the area is included under a Native Title Application (Claim) QC2012/019 by the Gkuthaarn and Kukatj People (QC12/19 - QUD685/2012). A determination of this application is anticipated in 2016.

The eastern portion of lot 1LA2, located in adjacent Croydon Shire, is also the subject of an Indigenous Land Use Agreement (ILUA) between Croydon Shire Council and the Tagalaka People (QI2013/030).

The Aboriginal parties for the eastern portion of lot 1LA2 area include:

- Tagalaka People #2 (QCD12/13 DET - QUD6020/2001)
- Tagalaka People #2 (QC01/22 PRC - QUD6020/01)

Stanbroke intends progressing freeholding of the property separately to this project proposal.

5.5. Planning Instruments, Government Policies

The following section provides an overview of the key legislation, policies and plans considered relevant to the project at the time of writing. Appendix A provides a detailed list of likely approvals required to implement the project.

5.5.1. Commonwealth

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection of Australia's environment and heritage, with a key focus on 'Matters of National Environmental Significance'. The EPBC Act also establishes environmental assessment and approvals processes, promotes ecologically sustainable development and recognises the role and knowledge base of Indigenous people in the conservation, sustainable use and management of Australia's biodiversity. TRIP will be referred under the provisions of the EPBC Act, however preliminary findings indicate that a controlled action decision outcome is considered unlikely. If TRIP is determined to be a controlled action, a bilateral assessment approach would be sought as the EIS and IAR processes under the *State Development Public Works Organisation Act 1971* (SDPWOA) are accredited assessment processes under the EPBC Act.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Purpose of this Act is to preserve and protect places, areas and objects of particular significance to Aboriginal People. This act is normally implemented through the provisions of the Queensland *Aboriginal Cultural Heritage Act 2003*.

Native Title Act 1993

The *Native Title Act 1993* provides for the recognition and protection of native title, establishes ways in which future dealings affecting native title may proceed, establishes a mechanism for determining native title claims and provides for the validation of past acts. Native title assessments will need to be undertaken for each land parcel and the unallocated state land associated with the Flinders River to determine whether Native Title exists and if so, the appropriate native title parties and procedural rights, and implications for the conversion of leasehold tenure into freehold.

White and Green Paper on Developing Northern Australia

The Australian Government has outlined its commitment to realising the potential of northern Australia, through the release of a Green Paper, outlining six possible policy themes including:

- Delivering economic infrastructure
- Improving land use and access
- Improving water access and management
- Promoting trade and investment, and strengthening the business environment
- Fostering education, research and innovation
- Enhancing governance

Whilst the formal policy position is still in development, TRIP is considered to be consistent with the principles discussed in the Green Paper. The White Paper will establish both policy and a plan for the next two, five, 10 and 20 years.

5.5.2. State

State Development and Public Works Organisation Act 1971

The *State Development and Public Works Organisation Act 1971* (SDPWOA) amongst other things, under Section 26 of the Act establishes the process for the declaration of 'coordinated projects' to be assessed by the Queensland Coordinator-General. As a result of recent legislative changes, two possible assessment pathways may be available under this process. These are:

- Environmental Impact Statement s26(1)(a)
- Impact Assessment Report s26(1)(b)

The Coordinator-General will determine the most appropriate assessment pathway. Each is an approved bilateral assessment approach under the EPBC Act.

Sustainable Planning Act 2009

The Sustainable Planning Act (SPA) governs planning and development in Queensland. A new planning act for Queensland is imminent, with the Draft Planning and Development Bill released in September 2014. It is likely that the new planning act will be in force at the time site approvals are required.

The Sustainable Planning Act currently covers aspects of development relevant to this project including:

- Building work
- Material Change of Use, Environmentally Relevant Activities (*Environmental Protection Act 1994*)
- Operational Works: clearing native vegetation (*Vegetation Management Act 1999*), taking or interfering with water (*Water Act 2000*), constructing or raising waterway barrier works (*Fisheries Act 1994*).

Land Act 1994

Conversion of tenure from leasehold to freehold is provided for under the *Land Act 1994*. Guidance is provided in 'Conversion of Leasehold tenure' PUX/952/121 (DNRM 2014). Consideration of Native Title Interests is a key component of this process.

Aboriginal Cultural Heritage Act 2003

This Act defines the process for the recognition, protection and conservation of Aboriginal Cultural Heritage, and also establishes the Duty of Care requirements for any work with the potential to disturb Aboriginal Cultural Heritage. The project has been assessed as a Category 5 under the Duty of Care Guidelines, identifying further consultation and management will be required with the relevant Aboriginal Party/ies.

Water Act 2000

The construction of the water extraction infrastructure and taking water under an allocation is governed by the *Water Act 2000*. This is further implemented through the Gulf Water Resource Plan. Granting of an increased allocation will be required under this Act. Interfering with water is also assessed under this act so the construction of bunds, offstream storages and levees may also require consideration.

Recent changes to the Water Act would, when implemented, allow private projects to be recognised as 'major water infrastructure projects' and for such projects to be granted a "water development option'. Should the changes be implemented as originally intended, Stanbroke intends applying for both and for the assessment under the Water Act to be undertaken coincidentally with that under the SDPWO Act.

The Gulf Water Resources Plan

The Gulf Water Resource Plan (Gulf WRP) was released in November 2007. It includes the area shown in Figure 12. Until May 2013, some 37,312 ML was available in the Flinders catchment, with 8,298 allocated to town, industrial or mining supplies. In May 2013 a further 80,000 ML was made available through the unallocated water tender process. Stanbroke was one of three successful tenderers and purchased 28,800 ML of allocation. The other successful tenders were also from major beef cattle companies. Unsuccessful tenders were submitted for a further 138,000 ML, which shows a very strong interest in accessing any new water. The Draft amended Gulf WRP generally followed the recommendations of the CSIRO report and suggested release of an additional 266 GL of water in the Flinders catchment and 486 GL in the Gilbert. Stanbroke provided a submission on the Draft plan and intends to access some of the water when it becomes available, in addition to its current licence, to support the Project.

Certainty of access to the necessary threshold volume of water to support the Project is a critical component of Project viability.

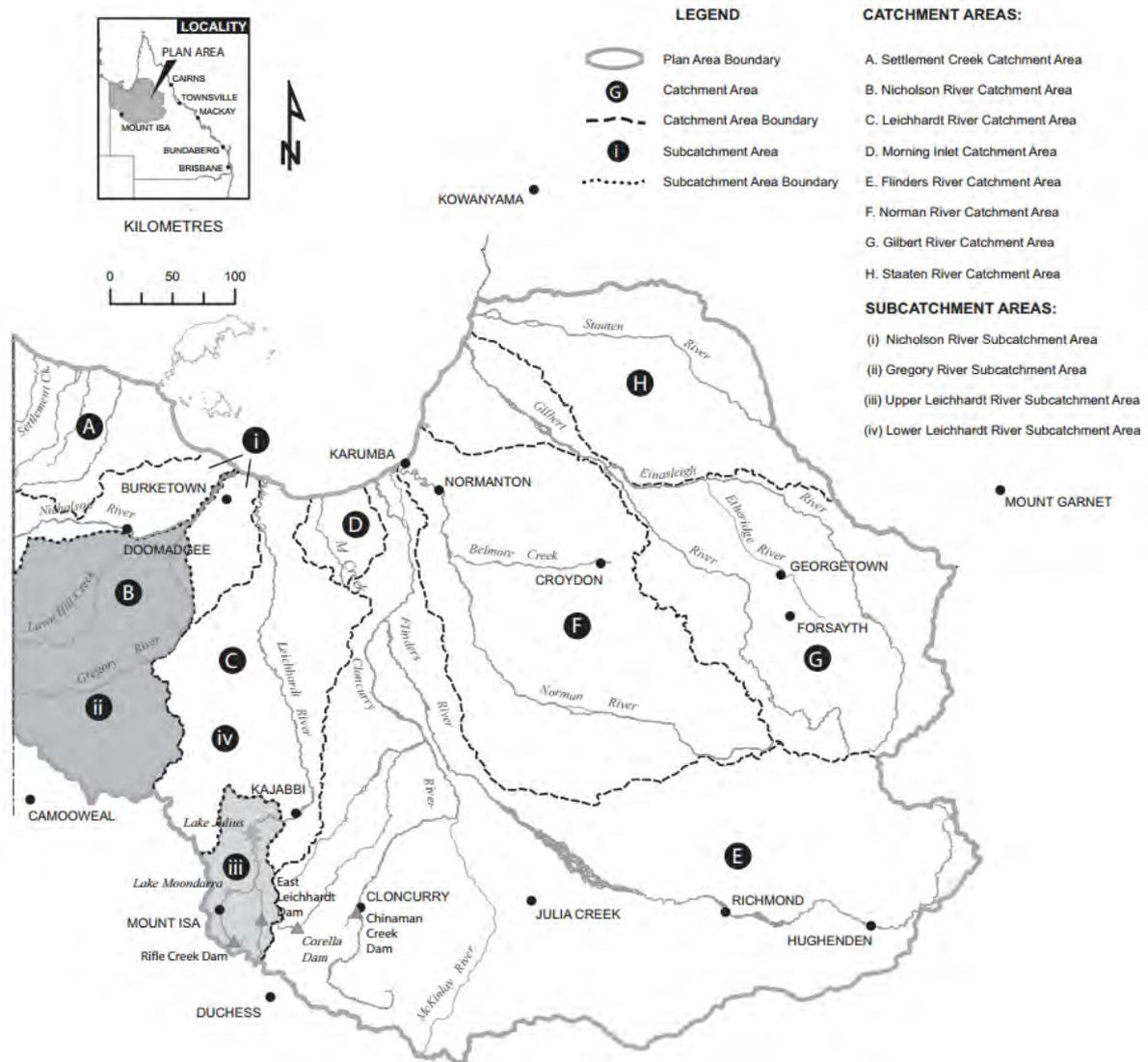


Figure 12: Gulf Water Resource Plan Area

source: Water Resource (Gulf) Plan 2007, Sch 3

Regional Planning Interests Act 2014

The Regional Planning Interests Act 2014 (RIPA) was introduced in 2014 to regulate regional development activities, with a focus on resource, water storage and agriculture. Whilst part of the site is mapped as an ‘important agricultural area’ in Queensland Government mapping, it is not mapped as a ‘Priority Agriculture Area’ or ‘Strategic Cropping Area’ as an area of Regional Interest. It is outside of mapped areas of ‘regional interest’, with the ‘Gulf Rivers’ Strategic Environmental Area located 40 km to the west of the project area. Therefore this Act does not apply.

Fisheries Act 1994

Construction of waterway barrier works (primarily the water extraction infrastructure) on the Flinders River will require waterway barrier works approval, which is currently operational works assessed under SPA. Other works including access tracks and enabling works in the bed and banks of a watercourse may also require assessment or self-assessment. The Flinders River and flood flows are mapped as 'major' risk for waterway barrier works, triggering specific requirements for maintaining fish passage.

Environmental Protection Act 1992

The *Environmental Protection Act 1992* (EP Act) governs a broad range of environmental aspects related to development and operation of projects such as this. This includes:

- General Environmental Duty, Duty to notify
- Carrying out Environmentally Relevant Activities (ERA)
- Depositing prescribed contaminants in waters
- Environmental Protection policies for water, air and noise
- Environmental Protection Regulation, applicable to regulated waste.

Land Protection (Pest and Stock Route Management) Act 2002

The construction and operation of the farm and associated infrastructure will be required to comply with the *Land Protection (Pest and Stock Route Management Act) 2002* for management of declared pests occurring in the project area.

Biosecurity Act 2014

The *Biosecurity Act 2014* will replace the provisions of the *Land Protection (Pest and Stock Route Management) Act 2002* relating to pests and weed management. A number of regulations for specific agricultural pests are currently being finalised. The new Act is anticipated to be operational by the end of 2015.

Queensland Heritage Act 1992

This act provides for the recognition and protection of Queensland's cultural heritage, and applies to ground disturbing works or works with the potential to impact on a Queensland or local heritage listed place. No such places have been identified through searches of registers, however further investigation will be required to confirm this.

Environmental Offsets Act 2014 and Queensland Biodiversity Offsets Policy 2014

Offsets for vegetation clearing and biodiversity losses may be applicable to this project. Requirements will be determined through subsequent environmental assessments.

Waste Reduction and Recycling Act 2011

This act provides for the implementation of general waste hierarchy principles (avoid, minimise, reuse, recycle) and requirements for local government waste disposal processes.

Forestry Act 1959

The provisions of this act relevant to the project apply to any timber or other state resources including sand or gravel of commercial value within 'state forests, timber reserves and on other lands'. Approval requirements for the use of state resources including sand or gravel will be dependent on the source (i.e. whether approval under the Forestry Act or Water Act applies).

Vegetation Management Act 1999

This Act establishes the process for determining, protecting and clearing remnant regional ecosystems. As the majority of the site is covered by 'least concern' regional ecosystems the provisions of this Act will require further consideration. Clearing of remnant regional ecosystems identified as 'regulated' is managed through SPA as an operational works approval. The Least

Concern REs are mapped as 'Category B' on the regulated vegetation management map, and a permit for the clearing of native vegetation for the purpose of irrigated high value agriculture would be required under Section 22DAB of the *Vegetation Management Act 1999*.

Nature Conservation Act 1992

Amongst other things this Act governs the clearing of protected plants. It also establishes the requirement for the conduct of flora surveys under the 'Protected Plants Flora Survey Guidelines' however the project area is not currently mapped in a flora survey trigger area. A number of exemptions now apply for clearing plants, special least concern plants and protected plants, these will be determined for their applicability to the project area through further environmental assessments.

Queensland State Planning Policy

A number of provisions under the Queensland State Planning Policy may be relevant to the project including:

- Liveable communities
- Matters of State Environmental Significance
- Water Quality
- Natural Hazards, risks and resilience.

5.5.3. The Queensland Plan

The Queensland Plan provides a blueprint for the State to 2036. The plan nominates a series of goals and objectives that are broadly categorised into 'foundation areas', as shown in Table 5.

Table 8: Queensland Plan Foundation Areas and the Project

Foundation Area	Relevant
Education: building life skills and inspiring bright minds	
Community: making connections	✓
Regions: building thriving communities	✓
Economy: forging diversity and prosperity	✓
Health and wellbeing: being healthy and active	
Environment: Achieving balance	✓
People: creation opportunities for everyone	✓
Infrastructure: being connected	✓
Governance: balancing all our interests	✓

5.5.4. Regional

The Carpentaria Planning Scheme (2008)

The project is located within the Carpentaria Shire. The provisions of the Carpentaria Planning Scheme (2008) will apply to a number of site approvals, including building approvals, operational works and potentially a material change of use for the gin, construction accommodation and landing strip. The process of converting leasehold land to freehold under the *Land Act* may require reconfiguration of a lot.

6. POTENTIAL IMPACTS OF THE PROJECT

6.1. Natural Environment

6.1.1. Land

Earthworks associated with development of the offstream storages and farming area are significant and will isolate that area from the surrounding landform. This is not seen as detrimental given the relative scale of the remaining landform. Standard erosion and sediment control procedures will be used during construction.

The risk of induced salinity is low due to the lack of groundwater and the proximity to the river (irrigation deep drainage water will readily drain to the river).

Some areas of the farm will conduct activities that have potential to contaminate land e.g. fuel and chemical storage. These areas will be appropriately constructed and maintained.

6.1.2. Water

The Project requires the extraction of approximately 150 GL of water per annum from the Flinders River or overland flow. The volume is anticipated to become available under the amended Gulf WRP. The licence would only be granted if it conformed to the WRP and did not impact on downstream users. Stanbroke is aware of only one current downstream user (other than via riparian rights). Ecological impacts are addressed in Section 6.1.4.

The levees on the floodplain will be designed to have minimal impact on floodplain flows and will cause only minor flow diversion which will be entirely on Stanbroke land. As such they will not impact downstream land uses or properties.

There will be no discharge from the farming area except related to overflow from the stormwater detention basin when it cannot be recycled on farm.

The Project does not require use of town water.

Sewage will be treated and disposed to land on site in accordance with procedures approved by Carpentaria Shire Council.

Groundwater issues are not envisaged, however these will be further examined during subsequent phases of project development.

6.1.3. Air and Emissions

The project will require significant earthworks over a number of years, predominantly during the dry season. Whilst there are very few air quality sensitive receptors in the vicinity, the resultant potential exposure of earthworks areas to water and wind erosive processes may result in impacts to the workforce. Dust suppression and avoidance of works disturbing the dry soil surface on excessively windy days will be required. Greenhouse gas emissions from fuel, cotton processing at the gin, and increased cattle production will require consideration in the development of a greenhouse gas management plan.

6.1.4. Ecosystems

6.1.4.1. Aquatic

The aquatic habitat within any weir pool will be altered to be a more substantial pool when full and if lowered at the end of the wet season, would still likely contain remnant water for longer than at present. While representing a change from the present situation, it is unlikely to be significantly

detrimental to the aquatic ecosystem and will offer some positive benefits related to greater permanence of the water body and this will benefit a number of species.

The major potential impact of the weir relates to the effect on movement of aquatic fauna, particularly fish, sharks and rays. The structure is a weir rather than a dam, it will be drowned-out whenever there is a reasonable wet season and in flood times there are numerous alternative paths which by-pass the structure. However, when not drowned out it will represent an impassable barrier and it is in the major low-flow path of the system. As such, a low flow fishway will be incorporated within the design. This will require consideration of the needs of all species, including Freshwater sawfish and barramundi. This impact will be taken into consideration when determining the cost-benefit of including the weir within the scope of the project.

Flow regime change related to water extraction is unlikely to cause significant impact to the aquatic ecosystem at this site and the risk assessment conducted by DSITIA (DSITIA 2014) ranked all risks to environmental assets at Walkers Bend as Low, (except Floodplain energy subsidy which ranked Moderate), even if up to 560 GL/annum were extracted from the catchment. It should be noted that DSITIA multiplied the Floodplain energy subsidy result by 3 before reporting the risk ranking and there appears no basis for doing so. If not so weighted, it also would have a risk ranking of Low.

Because the TRIP is in the lower catchment, the extraction has no impact on the upstream catchment. If the same volume were extracted in an upstream location not only would that extraction represent a greater proportion of the flow at that site, the impact of that extraction would be felt at all points downstream. The TRIP location allows the water to do all of its aquatic environmental “work” within the catchment before it is extracted.

The TRIP represents flood harvesting. It does not result in the regulation of the river or any alteration to the seasonality of flow, actions which have been repeatedly recognised as the cause of much impact associated with headwater storages and river distribution schemes in the Murray Darling Basin (Thoms *et al.* 2000).

Bayliss *et al.* (2014) investigated potential impacts of increased water extraction from the Flinders and Gilbert rivers on the catch of barramundi. CSIRO used worst case scenario modelling and estimated that if extraction increased by 560 GL per annum in the Flinders River, the barramundi catch may reduce by approximately 3%. At the Draft WRP proposed to release 266 GL, the impact would be proportionally reduced to approximately 1.4%. The impact of TRIP itself is again a proportion of that.

6.1.4.2. Marine

Potential impacts to the nearshore marine environment relate to flow regime change and delivery of sediment and nutrients from the catchment. Based on the CSIRO scenarios the total end of system median flow would be maintained at no less than 72% of current, so any significant impacts are unlikely. The Draft WRP proposes that the median annual flow be maintained at 78% of pre-development which is quite a conservative target.

The weir (if incorporated within the project) will only impact on the movement of coarse (rather than fine) sediment and based on Petheram *et al.* (2013), the rate of capture would only require management after approximately 50 years. At that time it could be physically extracted then deposited downstream of the weir. Any interruption is therefore likely to be minor and temporary. The flow of organic material or nutrients would not be interrupted as these are generally transported in suspension. Runoff from the farming area is unlikely to significantly contribute to the load entering the Gulf because the total area is a very small fraction of the total catchment. The farm will be operated to conform to the Cotton Best Practice program of Cotton Australia. The area will be leveed to control storm water run-off and will include a tailwater return system. Modern cotton farms have been shown to generally contribute less suspended solids or phosphorus to rivers than traditional cattle grazing, but they may contribute more nitrogen (Bartley and Speirs 2010). Given the proposed

cropping area is a maximum of 15,000 ha in a catchment of 10,940,000 ha (or 0.13%) which is primarily used for cattle grazing, the nett change will be negligible.

Bayliss *et al.* (2014) investigated the potential impact of water extraction on the Gulf banana prawn fishery. Despite noting their approach overestimated the impact by at least 60%, the original estimates have been published. Figure 3.14d of the CSIRO report shows the ratio of impact as approximately 1% potential reduction in prawn catch across the three catch zones for every 195-200 GJ of additional water extracted. The Draft WRP proposed release of an additional 266 GJ in the Flinders would equate to a corrected potential impact of approximately 1.4%. Even this is likely an overestimate because the CSIRO combined model showed a stronger relationship between flows in the Gilbert and prawn catch than it did with flows in the Flinders. The impact of just the TRIP project is again a proportion of this estimate.

6.1.4.1. Terrestrial

No endangered ecosystems under State or Commonwealth legislation are present in the Project area.

Riparian zone vegetation within any weir pool will be subject to more prolonged inundation than at present, with the degree of impact greatest at the weir wall and decreasing upstream as the depth of inundation decreases. Given the Project extraction from the pool and the likely low flow release requirements it is likely that the weir will be substantially emptied at the end of each wet season so it is possible that much of the vegetation will survive. Hence it is proposed to clear riparian vegetation from the weir construction area and then only clear valuable timber from the downstream end of the inundation area. Other riparian vegetation will be left intact.

The farm area will be fully cleared and levelled. This is primarily grassland, communities classified as Least Concern under the regional ecosystem framework.

6.1.5. Flora and Fauna

Dry and post wet season terrestrial flora surveys did not detect any threatened species. Dry season fauna surveys did not detect any threatened species and based on database searches, it is unlikely any threatened species will be found during post wet season surveys. Some habitat will be lost via vegetation clearing but this is unlikely to be significant to resident species. Migratory species make use of the habitat at different times and to different extents. As the farming area is essentially flood free, it is unlikely to provide significant habitat. A specific migratory bird survey conducted in April 2015 found few species on site, in low numbers and not apparently roosting or breeding. Larger colonies were observed in wetter areas some distance from the project area and these included potentially breeding Sarus Crane.

6.2. Amenity

With regard to any of the aspects of amenity, standard construction procedures will be employed to minimise impacts related to noise, air quality, vibration or lighting. The isolated location and lack of any nearby sensitive receptors determines that impacts will relate only to the workforce. Dust suppression will be a substantial task. The ginnyery will require night lighting which will be directional. There are no visual receptors other than vehicles traversing Iffley Road but these are infrequent and often represent Stanbroke staff. The infrastructure will not be out of place in a rural area.

6.3. Social Environment

6.3.1. Economic and Demographic Characterisation

An initial consideration of construction and operational workforce requirements has been undertaken (Section 3.8). The construction of the various project elements over the 2016 – 2018 period is anticipated to require a significant number of construction or construction-related roles, with a forecast peak on-site of 97 in 2017. This is significant in a local and regional context. On-site roles will be seasonal, with construction expected to be shut down over the wet season.

The operational workforce (fte, seasonal) on site when fully developed is predicted to be approximately 79, made up as follows:

- Farm; 60
- Ginnery; 15
- Water extraction infrastructure, pump station, off-stream storage; ancillary infrastructure 4.

This will vary with production levels, driven by water availability.

During construction direct offsite employment will relate to batching and transporting concrete, freighting other equipment (particularly pumps, pipes pre-fabricated metal, fuel, ginnery machinery), camp services (provisions, cleaning and maintenance) and waste disposal. The number of such workers has not yet been estimated. Many of these roles could likely be filled by local suppliers based in Normanton.

The offsite workforce associated with design, approvals or procurement prior to commencement of construction will not affect local demographics of the local economy but will help sustain employment in other regions.

With a reported workforce across the Carpentaria Shire of 1,042, and a population of 2,225, the potential for the creation of up to 80 long term (albeit seasonal) roles in the operations phase will have a noticeable effect on the labour market of the region. The seasonal nature of the roles may encourage some drive-in workers, with some accommodation provided on site.

The potential support requirements of the farm and ginnery may also generate secondary roles in services based in Normanton or the nearby region. Furthermore, the viability of this project may result in similar operations establishing in the region, expanding the potential employment and community growth opportunities, however these are anticipated to be concentrated in existing townships.

6.3.2. Accommodation and Housing

Onsite accommodation will be provided for the construction and operational workforce. This may be supplemented by workers based in Normanton. Initial estimates indicate that provision of on-site accommodation for up to 80 staff may be required. The option to accommodate the construction workforce in Normanton is unlikely to be preferred because of the necessary travel time and the extent of rooms required, which would impact on seasonal tourism accommodation availability. Similarly in the operations phase the seasonal pressure on accommodation in Normanton and the benefits of reducing travel time before and after long work days, probably favour the provision of at least some on-site accommodation. However this will be further considered and discussed with local accommodation providers.

6.3.3. Social and Recreational Services

The construction workforce is unlikely to place any additional pressure on social or recreational services. The higher the proportion of the operational workforce drawn from the current population, the lower the impact on social and recreational services.

6.3.4. Cultural Heritage

6.3.4.1. Indigenous

Based on the DATSIMA database search results, no records of sites, features or places are recorded in the vicinity of the project area, however this may be attributed to the lack of survey historically carried out over the project area.

The Project has been assessed as being a Category 5 risk under the Cultural Heritage Duty of Care Guidelines. This risk rating has been assigned based on the proposed additional ground disturbance in an area not previously subject to significant ground disturbance. Where an activity is proposed under category 5 there is generally a high risk that it could harm Aboriginal cultural heritage. In these circumstances, the activity should not proceed without cultural heritage assessment.

The Gkuthaarn and Kukatj People and the Tagalaka People are likely to require involvement in the project.

6.3.4.2. Non-indigenous

Searches of the Queensland and Australian heritage databases did not identify any sites, features or places in the project area. However the Flinders River is associated with the historic Burke and Wills expedition, with their northern most camp site located approximately 40 km north of the project area. Further assessment will be required to determine the potential association with the project area.

6.4. Economic Effects

6.4.1. Local

In the construction phase, it is unavoidable that significant expenditure will occur outside the local region because the services, equipment and skills are not available locally. However the Project will utilise a local participation policy which will aim to maximise the proportion of expenditure spent locally or regionally. The policy will include an indigenous participation component. Those local businesses that can provide appropriate services, such as servicing the accommodation camp, construction labour, machinery operators etc., will be identified through pre-tender registration of interest.

Significant local economic effects will be related to the employment offered in the operations phase. For example if the area remained as a beef cattle property it would result in employment of <1 fte person. The cotton farm would directly employ approximately 60 fte and the ginners a further 15 when fully operational, though it would vary with annual productivity. Additional indirect employment related to maintenance and repair of machinery and equipment is an area of potential local opportunity. Considering the population of Carpentaria Shire is just 2,225, TRIP will be a significant local employer.

Petheram *et al.* (2013) reported the gross value of the Gulf fishery (not including prawns) as \$22.5 M (2011-12) and that of the prawn fishery as \$94.7 M (2010-11). At approximately \$69 M at peak production, TRIP is a significant project. CSIRO predictions of impacts on the barramundi and banana prawn fisheries (which is each only a component of the two fisheries noted above) were both approximately 1.4% (proportionalised as noted above) related to the full extent of proposed increases in water extraction from the Flinders River, rather than just that associated with TRIP. As such, the possible economic cost to those industries is very low compared to the economic benefit derived from use of the water.

6.4.2. State

During the design and construction phase a substantial proportion of expenditure will occur outside the local area. This will be related to the provision of equipment and specialist services. Much of the pumping equipment and diesel motors may be imported, depending on the competitiveness of Australian suppliers. The areas most likely to benefit are Townsville and Brisbane.

In the operations phase the main inputs are farm machinery, agricultural chemicals, fuel, electrical power, gas and labour while the outputs are cotton bales and cattle. The main additional expenditure relates to transport (road) and port usage. Transport drivers can be based almost anywhere and the most likely ports to benefit are Brisbane and Townsville, though Karumba may develop to take advantage of the opportunity.

6.4.3. National

The flow on effects of increased expenditure and employment, and hence taxation, will have an effect nationally but are unlikely to be significant at that scale. However the location of the development certainly is significant because it clearly aligns with Government policy regarding development in Northern Australia. TRIP is a catalyst or threshold project because it is at a scale which can support development of further local and regional industry.

6.5. Built Environment

6.5.1. Infrastructure

The Project will have no direct effect on the existing built environment. Infrastructure services, including council water supply and wastewater treatment will not be affected by the project. Some construction waste may require offsite disposal, however the majority of cotton waste/by-product will be used for cattle feed. A growing regional population, partly as a result of the project, will place a strain on existing services and facilities.

6.5.2. Traffic and Transport

Construction and operational traffic will primarily impact on Iffley Road and the Burke Developmental Road, particularly between the site and Normanton. Directional impacts during the operational phase will depend on the development of the local ginnery and which port is used to export cotton or beef. Impacts at a significant level beyond the nearby area is unlikely. The region is familiar with large vehicles related to cattle transport. A Road Use Management Plan will be developed for each phase of the Project.

6.6. MNES under the EPBC Act

6.6.1. Summary

A search of the Protected Matters database has informed a referral under the EPBC Act and concludes:

- No world heritage properties are impacted or in the vicinity of the project area.
- No national heritage places are impacted or in the vicinity of the project area.
- No wetlands of International Importance are impacted or in the vicinity of the project area.
- No Commonwealth Marine areas were returned by the dataset search (however the relevance of the North Marine Region is discussed below)
- No impacts to the Great Barrier Reef Marine Park will occur
- The project is not an action on commonwealth land

- The project is not a coal seam gas or large coal mining development
- The project is not a nuclear action
- The project is not an action taken by the Commonwealth
- The project does not impact on any threatened ecological community
- The project potentially impacts on suitable habitat for five threatened fauna species (discussed in Table 5 in Section 5.1.5 and below) but no threatened flora species
- The project potentially impacts on suitable habitat for 22 migratory or marine species (discussed below).

6.6.2. Threatened Species

The likelihood of threatened terrestrial species occurring in the Project area was assessed in Table 5. As a result, a significant impact is not considered likely for any terrestrial species. The only aquatic threatened species which may be impacted is Freshwater sawfish and it is discussed below.

Freshwater sawfish (*Pristis pristis*, also known as *Pristis microdon*) (V) The Species Group Report Card (Sawfishes and River sharks) for the North Marine Region (DSEWPAC 2012) states “*The freshwater sawfish (Pristis microdon) has been recorded in northern Australia in rivers (including isolated water holes), estuaries and marine environments (Stevens et al. 2005). The species has also been recorded in offshore waters in northern Australia (Stobutzki et al. 2002). Freshwater sawfish appear to have an ontogenetic shift in habitat use, with neonates and juveniles primarily occurring in the freshwater reaches of rivers and in estuaries, while most adults have been recorded in marine and estuarine environments (Peeverell 2005; Thorburn et al. 2007). It is believed that mature freshwater sawfish enter less saline waters during the wet season to give birth (Peeverell 2005) and that freshwater river reaches play an important role as nursery areas. Popping appears to occur late in the wet season in the Gulf of Carpentaria (Peeverell 2005) and the strength of recruitment may be related to high water levels during the late wet season (Whitty et al. 2008). Riverine reaches can fragment into a series of pools in the dry season, reducing the available habitat (Stevens et al. 2005). The diet of freshwater sawfish is predominantly teleost fishes and benthic invertebrates, with important prey including blue catfish (Arius graeffei) and cherabin (Macrobrachium rosenbergii) (Thorburn et al. 2007).*”

The report recognises the main current threats as by-catch of commercial fishing or related to illegal or unregulated fishing. Changes to hydrological regimes either associated with climate change or land development (water extraction and construction of barriers) were recognised as “of concern”.

The SPRAT profile lists quite a few rivers as known to support the species but not the Flinders River. It does however state that it potentially occurs in all large rivers across northern Australia. Petheram *et al.* (2013) shows it from several sites within the catchment though it appears that only one of these is a substantiated record and it is downstream of the project area. The species is not restricted to Australia.

The profile suggests the species spends 3-4 years in freshwater before returning to the sea and this possibly explains why it appears restricted to the main channels of more permanent waterways.

A survey of aquatic habitats in the project area, including the pool downstream at Walkers Bend, was undertaken in May 2015 using netting, electrofishing and side-scan sonar. The survey particularly targeted sawfish but none were captured or otherwise identified.

The species **may occur** in the project area at least occasionally. The relative importance of this catchment and this population is uncertain but unlikely to be high, given the known importance of other catchments (e.g. Fitzroy River in Western Australia), the relatively low persistence of upstream pools and the failure to record it in the recent field survey. The main potential for impact on the species relates to the barrier effect of the weir. If a weir were not included, or the included weir was

only a low structure, then the potential impact would be assessed as unlikely to be significant. The weir pool may provide more substantive dry season habitat for the species depending on its operational management.

6.6.3. Migratory and Marine Species

The protected matters search returned 21 migratory species, being 20 birds and the saltwater crocodile. It also returned an additional marine species, Magpie goose, and a further species, Marsh sandpiper was identified during field surveys. Australian painted snipe (discussed in Table 5) was also returned in these categories.

Field surveys to date, including a specific migratory bird survey conducted in April 2015, confirmed the presence of:

- Common Greenshank (*Tringa nebularia*)
- Eastern Great Egret (*Ardea modesta*)
- Glossy Ibis (*Plegadis falcinellus*)
- Marsh Sandpiper (*Tringa stagnatilis*)
- Rainbow Bee-eater (*Merops ornatus*)
- Sarus Crane (*Grus antigone*)
- White-bellied Sea-eagle (*Haliaeetus leucogaster*).

No migratory birds were observed nesting or roosting in the project area during surveys to date. An aerial survey observed larger flocks of Sarus Crane beyond the project area with approximately 100 cranes on a wetland approximately 30 km west and these may have been breeding.

Most of these species are shorebirds, waders or wetland species. As most of the proposed farming area is flood free and not directly coastal, it is unlikely to provide substantive habitat.

Many of these species returned from database searches are non-breeding visitors to Australia and most are not listed as threatened in Queensland (other than as Special Least Concern), under the Action Plan for Australian Birds (2010) or on the IUCN Red List. Those which visit in large numbers do not have recognised significant aggregations in the Project area. Some which do breed in Australia are discussed below.

White bellied sea eagle. This sea eagle is listed as Least Concern (The Action Plan for Australian Birds 2010 and IUCN Red List) and it is not listed threatened in Queensland. The White-bellied Sea-Eagle is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. It also extends inland along some of the larger waterways, especially in eastern Australia. The inland limits of the species are most restricted in south-central and south-western Australia, where it is confined to a narrow band along the coast (Barrett *et al.* 2003; Bilney & Emison 1983; Blakers *et al.* 1984; Marchant & Higgins 1993).

Breeding has been recorded from only a relatively small area of the total distribution. Breeding records are patchily distributed, mainly along the coastline, and especially the eastern coast, extending from Queensland to Victoria, and to Tasmania. Breeding has also been recorded at some sites further inland, e.g. around the Murray, Murrumbidgee and Lachlan Rivers, in northern Victoria and south-west NSW, and at other large drainage systems and water storages (Marchant & Higgins 1993).

Main threats to the species are loss of habitat, particularly nesting habitat, and disturbance of breeding pairs.

It is possible that the inland extent of the species (and, perhaps, the area of occupancy) may have increased since European settlement, due to (Bilney & Emison 1983; Clunie 1994):

- (1) the stabilization of water levels in major rivers by weirs
- (2) the construction of reservoirs and dams
- (3) the introduction and proliferation of the European Carp (*Cyprinus carpio*), which is a favoured food item.

Significant impact on the species is not likely and it may benefit from the project.

Rainbow bee-eater. Rainbow bee-eater is widespread across mainland Australia and listed as Least Concern (The Action Plan for Australian Birds 2010 and IUCN red list) and is not listed as threatened in any state. It is seasonally common and locally abundant throughout much of its range. The only recognised threat is the cane toad which enters the birds nesting burrow and eats eggs and young. Predation by foxes or dingos may also be a threat. **Significant impact is not likely.**

Eastern Great egret. Great egret is common and widespread, including in Asia and Australasia. Numerous major breeding colonies are well known and not in the area of the project. "Western Cape York" is recognised as having minor breeding colonies. "*The most important populations of the Eastern Great Egret in Australia, based on the capacity for recruitment and abundance, are the breeding populations that occur at the Top End, in the Channel Country and in the Darling Riverine Plains and Riverina regions.*" The species inhabits a wide range of wetlands and the presence of water is essential for breeding. The main recognised threat is habitat degradation, particularly of wetlands (being drained, or not receiving sufficient water from regulated irrigation schemes). The species has been recorded in the project area. **Significant impact is not likely.**

Magpie goose. Magpie goose is listed as a marine species. It is listed as Least Concern (The Action Plan for Australian Birds 2010 and IUCN red list) and is not listed as threatened in Queensland. It is common across northern Australia and the east coast to northern NSW. Despite historic range contractions in the south, the northern populations do not show evidence of decline despite the existence of threats (Garnett and Crowley 2000). They feed in shallow swamps and grasslands and nest in large colonies. They will move hundreds of kilometres to perennial swamps in the dry season. As the project will not affect any perennial swamps or drain any wetlands. **Significant impact is not likely.**

Osprey The Osprey is listed as a marine species but is not listed as threatened in Queensland or globally. Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. The main recognised threat is habitat loss associated with urban or tourism development. Ingesting prey contaminated with pesticides is also recognised as a threat but regarded as subsiding in recent decades. **Significant impact is not likely.**

Sarus crane (M). Sarus crane is known from India, South East Asia and Australia and is recognised as a single species with three races. In Australia the species is known from northern Queensland from the Gulf country, Cape York and down the east coast to the Whitsundays. The Australian population has been variously estimated from about 5000 (Archibald *et al.* 2003) individuals to 10,000 breeding pairs (Garnett and Crowley 2000) and may be increasing (Jones *et al.* 2005). The largest non-breeding aggregation in Australia is on the Atherton tablelands. The birds migrate from this area to the Gulf of Carpentaria during the wet season for breeding and return to the tablelands as the Gulf begins to dry out. It is listed as Least Concern (The Action Plan for Australian Birds 2010) but Vulnerable (IUCN Red List). As the proposed farming area is flood free, the project is unlikely to impact on the wet season habitat of the species and the water storages may provide suitable dry

season habitat, though it would likely return to the Atherton Tablelands at that time and so not be present when most Project activity was occurring. As noted, the migratory bird survey only observed small numbers of cranes feeding in the project area but larger numbers potentially breeding some distance from the site and the site or birds would not be affected by the development. **Significant impact is not likely.**

An example of a non-breeding migratory species with known significant aggregations is the Oriental plover.

Oriental plover. The Oriental Plover is a non-breeding visitor to Australia, where the species occurs in both coastal and inland areas, mostly in northern Australia. Most records are along the north-western coast, between Exmouth Gulf and Derby in Western Australia, and there are records at a few scattered sites elsewhere such as in the Top End, the Gulf of Carpentaria and on Cape York Peninsula. Internationally recognised important sites in Australia are all in Western Australia (4) and Northern Territory (1). It is listed as Least Concern (The Action Plan for Australian Birds 2010 and IUCN red list) and is not listed as threatened in Queensland. There are no recognised immediate threats to its survival. **Significant impact is not likely.**

Migratory or marine reptiles are discussed below.

Salt water crocodile. Saltwater crocodile is a listed marine and migratory species. It is listed as Vulnerable in Queensland and lower risk, Least Concern on the IUCN Red list. The species is distributed broadly across northern tropical Australia, India, south-east Asia and some islands of the western Pacific. Its populations recovered quickly after cessation of hunting and restrictions on trade for other than farmed crocodiles. Its range is thought to be expanding and it is known as common in downstream areas of the Flinders River, though not so in the project area due to its seasonal lack of standing water. The project will potentially provide more suitable habitat for the species through the existence of the weir pool while the weir itself will not present a significant barrier to movement. **Significant impact is not likely.**

Freshwater crocodile. Freshwater crocodile is distributed across northern Australia, including in the Gulf rivers. It is not listed as threatened in Queensland and is listed as a marine species under the EPBC Act. No data is available on the SPRAT profile. It requires permanent water and its nest is a hole dug in an exposed sand bar during the dry season. The species appears widespread and abundant in Queensland with few threats (Webb and Manolis 2010). **Significant impact is not likely** and the weir pool would provide suitable habitat for the species.

6.6.4. Commonwealth Marine Area

The database search did not return a Commonwealth Marine Area but the project catchment drains to the North Marine Region and Plan area and specifically to the Gulf of Carpentaria Coastal Zone. Sawfishes and river sharks are identified in the Plan as under pressure at “of concern” level related to hydrological regime change and the same pressure is at “potentially of concern” level for the Gulf of Carpentaria Coastal Zone. Freshwater sawfish is addressed above as a threatened species.

Any impact on the area would be indirect, that is no works will occur in or adjacent to the area. The Gulf of Carpentaria Coastal Zone is influenced by the hydrological regime of eight catchments, including the Flinders River. Four of the catchments are designated as Strategic Environmental Areas (similar to the former “Wild Rivers” designation) under the *Regional Planning Interests Regulation 2014* (Staaten River, Morning Inlet, Nicholson River and Settlement Creek). The latter three catchments are closer to the important Wellesley group of islands than is the Flinders catchment. The islands are not within the Marine Area but are utilised by many of the marine fauna.

Bayliss *et al.* (2014) did not include the flows from the above systems, other than the Staaten River, when they estimated the contribution of the Flinders River to be 16% of the regional median discharge. As the median annual flow of the Flinders may be reduced by the order of 22-28%

depending on the scenario adopted, that produces a regional change of approximately 4% in the median year. More importantly, most discharge of sediment, organic matter and nutrients, and interactions with the floodplain, occurs during higher flow years and they are significantly less affected. The Draft WRP Environmental Flow Objectives for the Flinders River include 1.5 yr ARI < 10%; 5 yr ARI < 4.5%; and 20 yr ARI < 2%. This level of change is not considered likely to be a material influence on the Marine area.

Bayliss *et al.* (2014) reported a qualitative risk assessment of marine species and habitats related to the maximum proposed level of extraction from the combined Gilbert and Flinders rivers. The species with the highest risk ratings were those which spent part of their lifecycle in freshwaters or estuarine/nearshore environments. CSIRO then undertook a quantitative risk assessment on two such species, white banana prawn and barramundi and estimated impacts on annual catch associated with increased extraction from the Flinders River as approximately 1.4% for each (proportionalised as discussed above). This level of change is not likely to be ecologically significant and reflects the low level of change to higher flow levels. Any impact related to the TRIP project would be a proportion of this estimated total impact.

7. ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

7.1. Natural Environment

7.1.1. Land

The bulk earthworks phase of the project will require an erosion and sediment control plan, which will be developed to be consistent with current practice for construction projects, including IECA guidance. Soil management and conservation practices within the farm area will be consistent with the Best Management Practice (BMP) guidance for the cotton industry. Groundwater and salinity issues are not envisaged, however these will be further examined during subsequent phases of project development.

Land issues are expected to require routine assessment.

7.1.2. Water

The construction of a weir and subsequent impoundment of water from the Flinders Catchment will require design details to be evaluated to ensure fish passage and environmental flows can be maintained. Further details about the effect of drawing upon the required water allocation, and the rate at which it is proposed to be pumped will also be developed.

Approval for waterway barrier construction and a license to take or interfere with water will be required.

Groundwater issues are not envisaged, however this will require further analysis.

The extreme seasonality of rainfall will be one of the key considerations in the modelling of flood and runoff related impacts. Flood modelling will determine the appropriate height of bunds to protect built infrastructure while rainfall runoff modelling will determine the required stormwater retention capacity related to the growing areas at the farm site.

Water quality impacts of stormwater and irrigation runoff will be managed in accordance with the Best Management Practice guidance for the cotton industry, with reference to appropriate water quality values. Notably region specific environmental values and water quality objectives for the Southern Gulf Catchments are under development, hence no specific values are currently scheduled under the *Environmental Protection (Water) Policy 2009*.

Water aspects are expected to require detailed consideration and assessment.

7.1.3. Air and Emissions

Air quality impacts including dust and particulates transport will be managed through the implementation of erosion and sediment controls during construction, and application of BMP guidance for the cotton industry. Emissions from generators, pumps and vehicles will be considered in the air quality assessment for the project.

Air and emissions are expected to require routine assessment, with the preparation of a greenhouse gas management plan a component of the assessment.

7.1.4. Ecosystems, Including Flora and Fauna

Effects on aquatic ecosystems, particularly refuge pools resulting from changes to flow regimes and extents will require further assessment to determine management requirements. Water quality impacts from construction and farm operations will be managed as noted under section 7.1.2.

Offsets for vegetation clearing and biodiversity losses may be applicable to this project at State level. Requirements will be determined through subsequent environmental assessments.

Freshwater ecosystems are expected to require detailed consideration and assessment, particularly with regard to the potential barrier effect of the weir. Terrestrial and marine ecosystems are expected to require routine assessment.

7.2. Built Environment

7.2.1. Infrastructure

No impacts to existing infrastructure are envisaged, and the development of infrastructure at the site will be the subject of environmental impact assessment.

Infrastructure impacts are expected to be subject to routine assessment.

7.2.2. Traffic and Transport

Upgrade works to Iffley Road will require Council approval. There may be a requirement to upgrade the intersection of Burke Development Road and Iffley Road, however traffic impact assessment and pavement condition assessments will be needed to determine requirements. A Road Use Management Plan will be developed for each phase of the Project. Construction works in the vicinity of council roads will require appropriate traffic control measures.

Traffic and transport impacts are expected to be subject to routine assessment. The cumulative impact of similar operations across the wider region development would need to be addressed at the regional level, by the State and commonwealth Governments.

7.3. Social Impact Management Plan

A Social Impact Management Plan will be prepared as part of subsequent assessment and management planning, to address the following aspects during both construction and operation:

- community and stakeholder engagement
- workforce management
- construction workforce housing and accommodation
- local business and industry content
- health and community wellbeing.

The Social Impact Management Plan will describe how the project can respond to relevant Queensland Government policies and initiatives for local employment and business.

Whilst the scale of the project is significant in the context of its regional setting, it is considered that social and community aspects can be addressed as part of the routine assessment.

7.4. Cultural Heritage Management Plan (Indigenous)

The project has been assessed as a Category 5 activity under the Cultural Heritage Duty of Care Guidelines (Queensland Aboriginal Cultural Heritage Act 2003). Liaison with the relevant Aboriginal party will determine the requirement and type of cultural heritage management to be implemented on this project. It is envisaged that this can progress as a routine assessment, including a cultural heritage survey of the Project area. Native title and tenure processes will be progressed as a separate activity.

7.5. Non-indigenous Cultural Heritage Management

A non-indigenous heritage survey will be required to determine any issues or impacts will require management as a result of the project. There is little historic information documented about the project area, so further information will be gathered as part of the routine impact assessment.

7.6. Greenhouse Gas Management Plan

A greenhouse gas management plan will be developed as required, addressing the various stages of the development and emissions anticipated to require management.

7.7. Waste Management

The remoteness of the site will be influence efficiencies in resource use and waste management. Regulated waste, construction waste, waste water and organic wastes will be key considerations. Waste streams, volumes and requirements for treatment and disposal will be evaluated as part of routine assessments. Opportunities for beneficial reuse (e.g. cotton seed as cattle feed) will also be described.

7.8. Hazard and Risk, and Health and Safety

As part of routine assessment, a hazard and risk assessment will be undertaken, considering the construction, operation and maintenance stages of the project including:

- Preliminary earthworks and site preparation including accommodation camp
- The weir and fishway/s
- Water extraction and storage infrastructure including pumps and channels
- Farm area
- Landing strip
- Cotton gin.

Other hazard and risk aspects that will be considered in the risk assessment processes will include:

- Downstream risk
- Safety in design
- Remote working and transport
- Fatigue management
- Exposure to agricultural chemicals
- Flooding, wildfire, erosion.
- Climate resilience.

7.9. Environmental Management

The management measures identified during the impact assessment process will be documented as an environmental management plan, which will outline Stanbroke's commitment to ongoing environmental management for the life of the project. This will include clearly defined objectives, responsibilities, and corrective measures in the event of a non-conformance. This will be documented as part of the routine impact assessment process.

7.10. Approvals Required for the Project

Section 5.5 describes the Acts, Plans and Policies considered relevant to this project at this preliminary stage. Table 9 lists approvals identified for the project, and Appendix A provides a summary of the approvals assessment undertaken for the project. Further design refinements and project decisions may result in approvals identified in Table 9 no longer being required, conversely additional approvals may be identified due to project refinements. Approvals requirements may also change as a result of statutory or policy changes.

Table 9: Identified Approvals

Act/ Provisions	Permit or approval type	Project Elements	Responsible Agency	Comments
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	EPBC Act referral - controlled action or not a controlled action	Whole of project, in relation to Matters of National Environmental Significance	Department of Environment	Referral will be submitted.
<i>State Development and Public Works Organisation Act 1971</i>	Coordinated Project Assessment	Whole of project	Coordinator-General, Department of State Development, Infrastructure and Planning	A Coordinated Project declaration is sought. The project may be declared a coordinated project for which an EIS or IAR is not required, or it may be declared and require an Environmental Impact Statement or an Impact Assessment Report
<i>Water Act 2000</i>	Major Water Infrastructure Project, Water Development Option	Subject of Major Water Infrastructure Project Application	Department of Natural Resources and Mines	A coordinated project declaration is required to support the application for 'major water infrastructure project'.
	Water- taking or interfering with.	Applicable to separate project elements	Department of Natural Resources and Mines	To be confirmed once water development option outcome known. Would require further detail about design, quantities.
	Excavating or filling in a watercourse, lake or spring (Riverine Protection Permit)	Applicable to separate project elements	Department of Natural Resources and Mines	Design and construction methodology for weir and pump infrastructure to determine if triggered
<i>Queensland Aboriginal Cultural Heritage Act 2003</i>	Cultural Heritage Assessment/ Cultural Heritage Management Plan	Whole of project, ground disturbance areas	Department of Aboriginal and Torres Strait Islander Affairs	Further information required. Native Title / tenure issues being addressed by others
<i>Sustainable Planning Act 2009</i> (SPA)	Material Change of Use	Applicable to separate project elements, however a landing strip associated with 'station homestead' is a permitted use in the rural zone.	Department of State Development, Infrastructure and Planning and Carpentaria Shire	New Planning and Development Act may be in place prior to finalisation of assessment processes. Transitional provisions may apply, depending on timeframes.
				Requires definition of temp works/ ginnery requirements
<i>Fisheries Act 1994</i> (operational works under SPA)	Constructing or raising waterway barrier works (WWBW) in fish habitats	Weir Option, Pump infrastructure	Department of Agriculture, Forestry and Fisheries	Requires further design detail and impact assessment to confirm requirements.

Act/ Provisions	Permit or approval type	Project Elements	Responsible Agency	Comments
Vegetation Management Act 1999 (operational works under SPA)	Permit for the clearing of native vegetation for the purpose of irrigated high value agriculture would be required under Section 22DAB of the Vegetation Management Act 1999.	Clearing of native vegetation	Department of Natural Resources and Mines	The Least Concern REs are mapped as 'Category B' on the regulated vegetation management map, and a permit for the clearing of native vegetation for the purpose of irrigated high value agriculture would be required under Section 22DAB of the Vegetation Management Act 1999.
Water Supply (Safety and Reliability) Act 2008 (operational works under SPA)	Particular dams	Offstream Storages	Department of Energy and Water Supply	Requires design input to determine applicability and requirements for failure impact assessment.
<i>Environmental Protection Act 1994</i>	Environmentally Relevant Activities Environmentally Relevant Activities: ERA 8 Chemical storage	Onsite storage of fuels and herbicides	Department of Environment and Heritage Protection	Require further project definition to determine thresholds and applicable processes- may not be triggered
	Environmentally Relevant Activities Environmentally Relevant Activities: ERA 33 crushing milling, grinding or screening more than 5000t per annum	Ginnery		
	Environmentally Relevant Activities Environmentally Relevant Activities: ERA 63 Sewage Treatment	Accommodation		
Nature Conservation Act 1992	Permit to clear protected plants	Potentially applicable to vegetation clearing, if protected plants present	Department of Environment and Heritage Protection	Confirm requirements through impact assessment.
	Species management program	Potentially applicable to habitat clearing	Department of Environment and Heritage Protection	Confirm requirements through impact assessment.
Environmental Offsets Act 2014	offsets for protected plants, habitat for protected species	Subject to identification of requirements	Department of Environment and Heritage Protection	Requires further impact assessment to determine requirements for offsets.

7.11. Costs and Benefits Summary

7.11.1. Local, State and National Economies

Preliminary economic considerations highlight the potential for this project to deliver local, regional and State wide benefits. It is anticipated that this project may be the catalyst for other similar developments, providing regional economies of scale in the diversification of the agricultural industry in the north. The project supports State and Commonwealth Government policies in this regard, and will also generate regionally significant employment opportunities. In summary, the key economic and social benefits of this project are anticipated to include:

- Diversification of regional agricultural products
- Increased output from irrigated agriculture in North Australia
- Increased security of and output from beef cattle production
- Increased diversity of regional support businesses
- Increased port throughput and possible expansion
- Increased regional employment
- Development of Northern Australia.

The potential economic impact of water extraction *per se* on Gulf banana prawn and barramundi fisheries is recognised as much less than the potential benefit generated from the expanded irrigated agriculture.

7.11.2. Natural and Social Environments

No significant impacts to MNES or MSES are anticipated, however field investigations will be carried out to provide further context for these aspects. An EPBC Act Referral will be submitted. Environmental flows and hydrological regimes will be further investigated as part of future environmental assessments though if the Project conforms to the amended WRP, those issues will essentially have been addressed through development of that Plan.

The local social environment will benefit from the points listed above but there may be some negative impacts related to Gulf fisheries. These impacts relate to total water extraction, not just that proposed by TRIP and the level of extraction will be in accordance with the finalised WRP for the Gulf region.

7.11.3. Community and Stakeholder Consultation

No community or stakeholder consultation has been undertaken to date, this would progress in accordance with statutory requirements, including public notification of the proposed project under the EPBC Act Referral Process and the Coordinated Project process under the SDPWOA, as required.

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APPENDIX A INITIAL APPROVALS ASSESSMENT

TRIP- Initial Approvals Assessment

Act/ Provisions	Considerations	Whole of Project	Weir Option	Water Extraction (riverine/ overland flow)	Offstream storages	Earthworks (for cropping and water management)	Cotton growing and harvesting	Ginnery	Temporary works	Ancillary infrastructure, eg landing strip, accommodation	Comments
Primary Approvals											
<i>Environment Protection and Biodiversity Conservation Act (EPBC Act)</i>	EPBC Act referral - controlled action or otherwise	Subject of EPBC Act Referral	included in referral	included in referral	included in referral	included in referral	included in referral	included in referral	TBC	TBC	Referral will be submitted.
<i>State Development and Public Works Organisation Act 1971</i>	Coordinated Project Assessment (subject to IAS outcome)	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	Subject of IAS- EIS, IAR, or "not required" to be determined	A coordinated project declaration is required to support the application for 'major water infrastructure project'.
<i>Water Act 2000</i>	Major Water Infrastructure Project, Water Development Option	Subject of Major Water Infrastructure Project Application									
<i>Regional Planning Interests Act 2014</i>	Regional Interests Development Approval	NA	NA	NA	NA	NA- not in an Area of Regional Interest	NA- not in an Area of Regional Interest	NA- not in an Area of Regional Interest	NA	NA	Site is outside area of regional interest, although part of site mapped as 'important agricultural area' and ALC Class A and B. Broadacre cropping is a regulated activity, but this is not occurring within a strategic environmental area.
<i>Queensland Aboriginal Cultural Heritage Act 2003</i>	Cultural Heritage Assessment/ Cultural Heritage Management Plan	TBC- likely	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	Further information required. Native Title / tenure issues being addressed by others
<i>Sustainable Planning Act 2009</i>	Material Change of Use (see below for operational works)	Applicable to separate project elements, including landing strip, however a landing strip associated with station homestead is a permitted use in the rural zone.	NA	NA	MCU	MCU	MCU	MCU	potentially MCU for accommodation/ camp site	TBC, landing strip may be a permitted use and not require an MCU	New Planning and Development Act may be in place prior to finalisation of assessment processes. Transitional provisions may apply, depending on timeframes.
	Building works	Applicable to separate project elements	NA	NA	NA	NA	NA	Building works	TBC- potentially for accommodation	TBC	Requires definition of temp works/ ginnery requirements
State Development Assessment Provisions											
Aquaculture		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	NA
Environmentally Relevant Activities (<i>Environmental Protection Act 1994</i>)	Material Change of Use	Applicable to separate project elements	NA- Assumes concrete batching offsite-delivered to site and assumes ERA 16 extractive and screening activities not triggered	NA	Potentially ERA 64 Water Treatment	Potentially fuel and herbicides storage (Chemical Storage ERA 8)	Potentially ERA 33 - crushing milling, grinding or screening more than 5000t per annum/	Potentially ERA 17 fuel burning (more than 500kg/hr)	temporary/ permanent accommodation - potentially ERA 63 Sewage treatment		Require further project definition to determine thresholds and applicable processes- may not be triggered

Act/ Provisions	Considerations	Whole of Project	Weir Option	Water Extraction (riverine/ overland flow)	Offstream storages	Earthworks (for cropping and water management)	Cotton growing and harvesting	Ginnery	Temporary works	Ancillary infrastructure, eg landing strip, accommodation	Comments
Fisheries development other than Aquaculture	Development in a declared fish habitat area	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not in a declared fish habitat area.
	Constructing or raising waterway barrier works (wwbw) in fish habitats	Applicable to separate project elements	Waterway Barrier Works - Flinders River mapped as 'major' for WWBW	NA	NA	NA	NA	NA	Potential-temporary wwbw self assessable-design and construction details to determine	NA	Requires further design detail and impact assessment to confirm requirements.
	Removal, destruction or damage or marine plants	Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	Tidal limit approx. 65-70 km downstream, marine plants not expected.
Native Vegetation Clearing (<i>Vegetation Management Act 1999</i>)	Clearing of remnant native vegetation	Applicable to separate project elements	TBC - riparian veg impacts likely	TBC - riparian veg impacts likely	Clearing permit	Clearing permit	NA	Clearing permit	TBC	TBC	The Least Concern REs are mapped as 'Category B' on the regulated vegetation management map, and a permit for the clearing of native vegetation for the purpose of irrigated high value agriculture would be required under Section 22DAB of the Vegetation Management Act 1999.
Queensland Heritage	Queensland Heritage Place / Local government heritage place	Applicable to separate project elements	search results- no sites	search results- no sites	search results- no sites	search results- no sites	search results- no sites	search results- no sites	search results- no sites	search results- no sites	Search results- no sites.
Coastal Management Act	Tidal works or development in a coastal management district	NA	NA	NA	NA	NA	NA	NA	NA	NA	Outside coastal management zone and tidal limit.
Water Act 2000	Water- taking or interfering with.	Applicable to separate project elements	operational works	operational works	operational works	potentially operational works	NA	NA	NA	NA	To be confirmed once water development option outcome known. Would require further detail about design, quantities.
	Excavating or filling in a watercourse, lake or spring (Riverine Protection Permit)	Applicable to separate project elements	Potentially required	TBC- informed by pump station design	NA	NA	NA	NA	NA	NA	Design and construction methodology for weir and pump infrastructure to determine if triggered
Wetland protection area		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	No wetland protection areas in the vicinity or downstream
Major hazard facilities		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	NA
Airport land		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	NA
Particular dams		Applicable to separate project elements	TBC- informed by dam design	NA	TBC- informed by water storage design	NA	NA	NA	NA	NA	requires design input to determine applicability
Particular levees		Applicable to separate project elements	NA	NA	Category 1 TBC	Category 1 TBC	NA	NA	NA	NA	design to demonstrate no off-property impact- self assessable
Regional Plans	MCU	Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	only applicable for South East Queensland

Act/ Provisions	Considerations	Whole of Project	Weir Option	Water Extraction (riverine/ overland flow)	Offstream storages	Earthworks (for cropping and water management)	Cotton growing and harvesting	Ginnery	Temporary works	Ancillary infrastructure, eg landing strip, accommodation	Comments
Public passenger transport		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	
Railways		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	
State Controlled Roads		Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	Weir location approx. 20 km upstream of Cloncurry-Normanton Road (state controlled). Other roads in vicinity not state controlled
Other											
Contaminated land (EP Act)	Soil Disposal Permit	Applicable to separate project elements	NA	NA	TBC	TBC	TBC	TBC	TBC	TBC	Conduct searches of the EMR/CLR to confirm risk (low)
Fisheries Act 1994	Work in a declared fish habitat area	Applicable to separate project elements	NA	NA	NA	NA	NA	NA	NA	NA	Works are not in a declared fish habitat area
Work on a local government controlled road	Iffley Road	Applicable to separate project elements	NA	Potential	NA	potential	NA	NA	Potential	Potential	TBC- once access arrangement for Iffley Road confirmed.
Nature Conservation Act 1992	permit to clear protected plants	Applicable to separate project elements	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	Confirm requirements through impact assessment.
Nature Conservation Act 1992	Species management program	Applicable to separate project elements	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	Confirm requirements through impact assessment.
Resource entitlement/ owners consent	TBC	Applicable to separate project elements	TBC	TBC	NA	NA	NA	NA	NA	NA	
Transport Infrastructure Act 1994	Road closure	Applicable to separate project elements	NA	NA	NA	TBC	NA	NA	NA	NA	TBC- once access arrangement for Iffley Road confirmed.
Forestry Act 1954	Quarry or Forestry material from State Lands	Applicable to separate project elements	potential							potential- road works	Confirm presence of marketable timber and requirements for extraction of state resources from waterway.
Environmental Offsets Act 2014	offsets for protected plants, habitat for protected species	Subject to identification of requirements	potential	NA	potential	potential	potential	potential	NA	potential	Requires further impact assessment to determine requirements for offsets.
State Planning Policies											
Liveable communities	SPP Code- fire	Potentially relevant to separate elements	NA	NA	NA	NA	NA	TBC	TBC	NA	Design detail needed to determine requirements
Mining and extractive resources	Proximity to Key Resource Area	NA	NA	NA	NA	NA	NA	NA	NA	NA	No KRAs in vicinity
Matters of State Environmental Significance	Protect and enhance MSES	TBC	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Least Concern RE on site, but fragmented portions of MSES regulated veg along riparian corridor. Also to consider aquatic habitats downstream, etc. Limited MSES mapped in vicinity/ downstream.
Coastal environment	Not applicable	NA	NA	NA	NA	NA	NA	NA	NA	NA	Outside coastal zone/ CMD
Water quality	Receiving waters	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA- not for 'urban purposes'
	Acid sulfate soils	NA	NA	NA	NA	NA	NA	NA	NA	NA	Extremely low probability/ low confidence' - confirm with more detailed map review
Emissions and hazardous activities		NA	NA	NA	NA	NA	NA	NA	NA	NA	Not in an emissions/hazard management area
Natural hazards, risks and resilience	Flood	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Project area is within the Flood Hazard area - level 1 Queensland

Act/ Provisions	Considerations	Whole of Project	Weir Option	Water Extraction (riverine/ overland flow)	Offstream storages	Earthworks (for cropping and water management)	Cotton growing and harvesting	Ginnery	Temporary works	Ancillary infrastructure, eg landing strip, accommodation	Comments
	Bushfire	Applicable	applicable	NA	NA	check footprint	NA	NA	confirm footprint	confirm footprint	Riparian veg along Flinders River mapped as medium bushfire risk
	Landslide	Unlikely	NA	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	Confirm - considered unlikely
	Coastal hazard	NA	NA	NA	NA	NA	NA	NA	NA	NA	Outside coastal zone/ CMD
State Transport Infrastructure	Development (MCU or ROL) that has a total site area equal to or more than 5000m ²	Potentially relevant to separate elements	NA	NA	NA	NA	NA	potentially relevant	NA	potentially relevant	Confirm on review of SPP code Land use and transport integration. Unlikely to be relevant, focused more on PT provision
Strategic Airports and aviation facilities	Normanton Airport is listed in the SPP as a strategic airport or aviation facility	Potentially relevant, though outside the 15 km buffer	NA	NA	NA	NA	NA	NA	NA	NA	Noted that the site is just outside the 15 km buffer to the Normanton Aviation Facility.

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