

REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Department of Transport, Planning and Local Infrastructure (DTPLI) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once DTPLI is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
 - a brief description of potential changes or risks to environmental assets resulting from the project;
 - available information on the likelihood and significance of such changes;
 - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB.**

- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

**Minister for Planning
GPO Box 2392
MELBOURNE VIC 3001**

Couriers

**Minister for Planning
Level 20, 1 Spring Street
MELBOURNE VIC 3001**

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@dtpli.vic.gov.au is encouraged. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	Origin Energy Resources Limited
Authorised person for proponent:	Sean Dunn
Position:	HSE Team Lead Halladale Blackwatch & Speculant Project
Postal address:	PO Box 186 Melbourne Vic 3001
Email address:	sean.dunn@originenergy.com.au
Phone number:	+61 3 8665 7178
Facsimile number:	+61 3 9652 5552
Person who prepared Referral:	Sean Dunn
Position:	As above.
Organisation:	
Postal address:	
Email address:	
Phone number:	
Facsimile number:	
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	<p>Origin Energy Resources Limited (hereafter "Origin") is a leading integrated energy company listed on the Australian Stock Exchange with over 4,000 employees and more than 4.5 million customers in Australia and New Zealand. Origin has an extensive conventional gas exploration and production portfolio with 'in-house' expertise in gas production, pipeline engineering and construction management. A number of suitably qualified consulting firms have been engaged to undertake the necessary investigations and support the preparation of this referral, including:</p> <ul style="list-style-type: none"> • WorleyParsons (environmental management and approvals) • Biosis (flora and fauna, and water quality) • Ochre Imprints (cultural heritage) • Ecology and Heritage Partners (targeted fauna surveys) • Coffey Geotechnics Pty Ltd (geotechnical investigations) • Wood Group Kenny (pipeline survey)

2. Project – brief outline

Project title: Halladale and Speculant Pipeline Project

Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The Otway Basin is one of the best known and most actively explored basins on the southern coastline of Australia. Origin has defined commercial gas reserves in the Halladale, Blackwatch and Speculant gas fields within retention lease VIC/RL2(V). Origin will recover the gas from these offshore fields using extended reach wells (sub-surface) drilled from an onshore well site. The onshore well site is located within Moyne Shire, approximately 3km southwest of the locality of Nirranda South, 30 km east of Warrnambool and 300 km southwest of Melbourne. These petroleum activities were the subject of a separate referral in 2011 (Referral Number 2011R-02) and were subsequently approved under petroleum, planning and environmental legislation.

Gas would be transported from the well site to Otway Gas Plant (OGP) by a new gas pipeline. A new monoethylene glycol (MEG) pipeline and fibre optic cable would also be installed within the same pipeline trench.

Table 1 provides the project coordinates of the pipeline alignment as shown on **Attachment 1** – map of the pipeline alignment.

Table 1 – Pipeline Coordinates

Location Point	Latitude	Longitude
1 Drill pad	38° 32' 49" S	142° 46' 01" E
2 Baileys Road	38° 32' 21" S	142° 46' 26" E
3 Cnr Baileys Road and Borthwicks Road	38° 31' 54" S	142° 46' 32" E
4 Dances Road	38° 32' 09" S	142° 48' 41" E
5 South of Heatleys Road	38° 29' 45" S	142° 49' 08" E
6 Curdies Creek Crossing	38° 30' 33" S	142° 51' 19" E
7 East West Road	38° 31' 20" S	142° 52' 57" E
8 Boundary Road	38° 31' 51" S	142° 55' 42" E
9 Squibbs Road	38° 32' 03" S	142° 56' 36" E
10 Otway Gas Plant	38° 34' 8.55" S	143° 2' 14.35" E

Short project description (few sentences):

Origin has discovered gas reserves in the Halladale, Blackwatch and Speculant gas fields in the Otway Basin. Gas will be transported from the well site to the OGP, north of Port Campbell, via pipeline for processing. A new section of DN 200mm gas pipeline would be installed and co-located with a DN 50mm mono-ethylene glycol (MEG) pipeline and fibre optic cable (FOC). The new gas pipeline is approximately 33km in length.

MEG is required for flow assurance and is injected into the gas stream at the well site. Corrosion inhibitor is incorporated with the MEG to provide protection to the internal surface of the gas pipeline. The FOC is required for communication between the well site and OGP.

Origin is seeking regulatory approval for the construction of the new pipelines.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

The objective of the Project is to construct a new gas pipeline, primarily within an existing easement, to transport natural gas from the well site to OGP for processing. A new pipeline is also required to transport MEG to the well site.

Natural gas reserves provide low carbon, cost-effective energy to the region's population and would provide energy security to Victoria during its transition to fuels with lower greenhouse gas emissions.

Background/rationale of project (describe the context / basis for the proposal, eg. for siting):

At the planned rate of extraction, the Halladale, Blackwatch and Speculant gas fields are expected to be commercially viable for 10 -15 years. The gas will supply the OGP which is now operated and partially owned by Origin Energy (67.5%). The project will have the capacity to generate an average daily gas production of 20 to 30 TJ/d, depending on seasonal demand, with a maximum daily production capacity of 65 TJ/d. Security of gas supply is important to Origin and its customers as reserves from nearby producing fields such as Thylacine are declining.

Initially Origin proposed to re-use an existing licensed pipeline for much of the pipeline route, and construct two new sections of 200mm of gas pipeline to connect the western end of the existing pipeline to the well site, and at the eastern end to connect through to the OGP.

To allow for greater than expected production from these gas fields ascertained by recent exploratory drilling, a new higher capacity 200mm gas pipeline (approximately 33km) is required to replace the existing pipeline to transport the natural gas from the well site to OGP. No physical works will be undertaken on the existing licensed pipeline that has been cleaned and will remain 'in situ' for possible future use.

MEG is required to remove water vapour from the gas stream prior to processing at the OGP. It is injected with the gas stream at the pipeline from the drill site. Origin has determined that due to the quantity of MEG required and to reduce operational requirements, the MEG will be transported via pipeline from the OGP back to the well site.

The project has been designed to maximise use of an existing pipeline easement. Much of the study area has been modified by the construction of the existing gas pipeline and farming activities. However, the preliminary pipeline route has been realigned in a number of locations, or an alternative construction method adopted (i.e. horizontal directional drilling), to avoid and minimise impacts to ecological values identified within the pipeline corridor.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

Pipeline

The scope includes the following pipeline construction activities totalling 33km including:

- Installation of a 200mm diameter pipeline from the well site to OGP; 33km.
- Installation of 50mm diameter MEG pipeline and a fibre optic cable from the well site to OGP 33km.
- A short above ground section of pipeline (~130m) within the OGP fenceline to connect in with the pig receiver.

A schematic representation of the pipeline route is provided below in Figure 1.

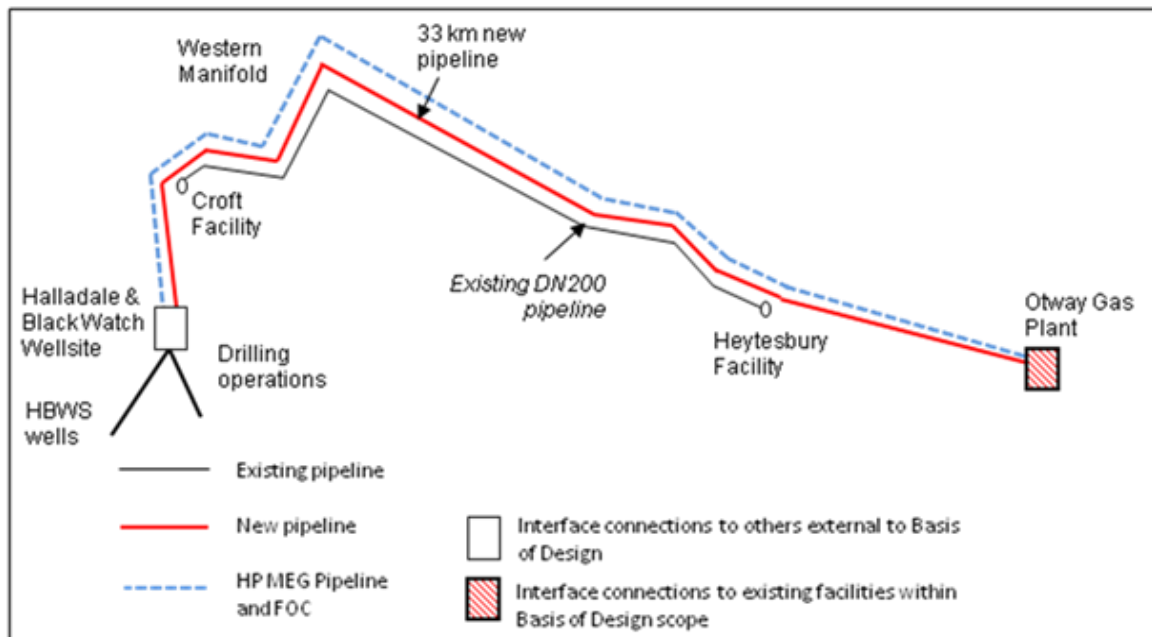


Figure 1 Description of Pipeline Route

The pipeline will be constructed in accordance with Australian Standard Pipelines – Gas and Liquid Petroleum (AS2885). Construction activities will be confined to a designated area known as the right-of-way (ROW) and additional work spaces (AWS). The width of the ROW that will be affected by the pipeline installation work is 25 metres in the existing easements from Croft to Heytesbury, i.e. 5 metres on the spoil side and 20 metres on the working side of the proposed centreline, and 27 metres on the working side for the new gas pipeline sections in new easements. The pipeline will be buried to a minimum depth of cover of 1.2m.

The proposed pipeline alignment is as per **Attachment 1**.

Pipeline Signs

Pipeline signs will be located along the proposed replacement pipeline in accordance with AS2885.

Monitoring Systems

Pipeline pressure, temperature and flow rate of the gas and MEG pipelines will be monitored continuously. A Process Control System and Separate Safety Instrumented System will be installed. The system will be monitored by Origin staff operating at the OGP.

Communication between the well site and the OGP will be achieved via a dedicated FOC. The FOC will be installed in the same trench as the new gas pipeline and MEG replacement pipeline.

Ancillary components of the project (eg. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

The ancillary components of the project include those related to construction being the access roads, a lined sump to store water based drilling fluids produced during construction of the surface hole at the sites of horizontal directional drilling (HDD), sediment fencing within 200m of key habitat areas (i.e. wetland areas), pipeline laydown areas, drainage control structures, and parking areas.

Key construction activities:

Pipeline construction

The standard sequence of pipeline construction activities will commence with securing access to the land and confirming access protocols with the landowner, concluding with reinstatement of sites and commissioning of the gas pipeline.

Construction activities will be confined to the ROW, which will contain temporary vegetation stockpiles, topsoil stockpiles, trench spoil stockpiles, pipe stockpiles, the pipeline trench, a construction access track and drainage control structures (Figure 2). The width of the ROW that will be affected by the pipeline installation work is approximately 25 to 27 metres, i.e. 5 to 7 metres on the spoil side and 20 metres on the working side. The 20 metre working side is typically on the northern side of the proposed pipeline trench.

The Construction ROW has been reduced in some areas to minimise the potential impacts on adjacent areas of significant vegetation (to achieve a 10m construction buffer) where possible.

As far as is practicable, construction will also be timed to avoid the wetter months of the year to reduce construction delays, damage to tracks and farmlands and the risk of turbid run-off.

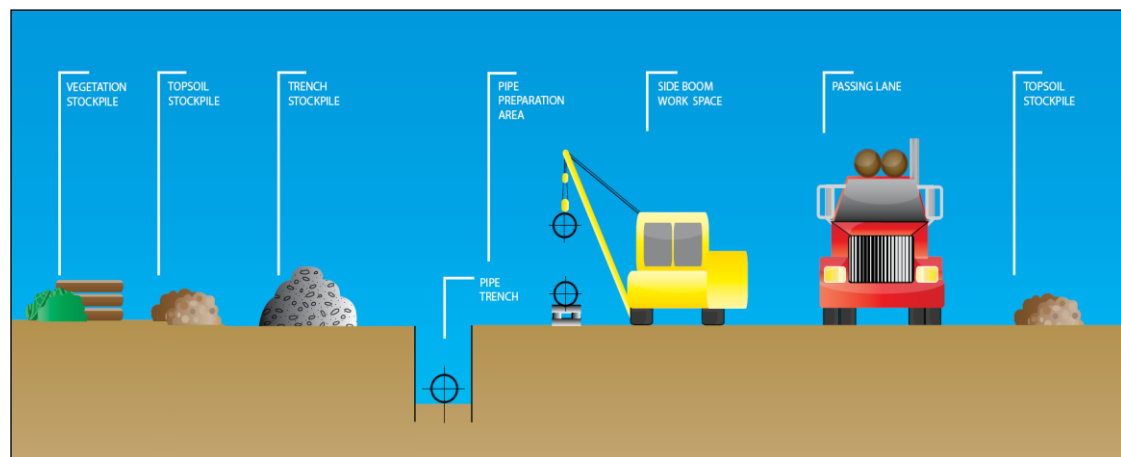


Figure 2 Typical Pipeline ROW Construction Cross Section

Establishing access to Construction ROW

Construction vehicles, plant and equipment will access the Construction ROW from public roads and via access tracks. As far as practicable, access routes will use existing access tracks/roads. The location of access tracks will be negotiated with landowners and occupiers. Access tracks will be kept to the minimum width practicable for the safe movement of heavy vehicles.

The pipeline will be constructed in the following phases:

Clear and Grade

The earthmoving phase of pipeline construction begins with clearance of pasture or woody vegetation and the grading of topsoil.

Both the vegetation and the topsoil will be stockpiled for later reuse in the rehabilitation of the ROW.

Pipe Stringing

The pipeline will be constructed in sections of 12 -18m in length. Each section will be coated in two layers of fusion-bonded epoxy coating to reduce the risk of damage and corrosion.

Trench Excavation

The majority of the pipeline trench is excavated using bucketwheel ditchers or hydraulic excavators. The depth of the trench will vary with the terrain and the existing land use but will typically allow for a minimum cover of 1200mm (distance from top of the pipe to grade level). Ramps will be cut into the ends of trenches to allow the escape of any animals that may make their way into the trench.

Open cut trenching is also proposed for waterways that are typically dry, or would result in minimal environmental impact, at the time of construction. The stream banks and bed will be rehabilitated to their existing morphology post construction.

Special Crossings

Origin proposes to construct the pipeline underneath most sealed roads by using HDD methods. These methods do not involve excavation of a trench and instead, a starter hole (the bell hole) is dug and a drilling rig used to directly install the pipe by boring at below the feature. As such HDD can avoid disturbance of the road surface, and in most cases, the roadside vegetation.

Curdies River will also be traversed by HDD where it has been determined that open cut trenching may create environmental impacts through physical disturbance to species, habitat or cause downstream water quality impacts. The high flow regime in the Curdies River would preclude the use of a typical dam and pump technique that is typically used for trenched wet crossings.

Two vertically separated directional drills will be adopted at Curdies River. A directional drill for the MEG pipeline and FOC will cross under the river at a minimum of 10 metres below the invert. The second directional drill for the gas pipeline will cross under the river on the same alignment at a greater depth.

Similarly there will be two separate horizontal directional drills for crossing underneath paved roads.

Welding and Joint Coating

Welding links the individual pipe sections into a single, continuous pipe 'string' and will be carried out by manual means. Once welding has been completed, every weld is X-rayed to ensure its integrity before being grit blasted in readiness for the joint coating that will further reduce the risk of corrosion.

Lowering-in

Once the pipe string has been completed, a fleet of side-boom tractors lift the pipeline and carefully lower it into the trench. This process must be done with care to avoid damage to the pipe and requires both sufficient lateral clearance either side of the pipe and the use of a suitably fine-grained packing material (also known as bedding) below the pipe.

Backfilling

Trench spoil is returned first and a slight crown may be formed over the trench to allow for settlement and similarly, crown breaks (i.e., periodic gaps in the line of the crown) are provided to maintain the natural drainage patterns in the area. The final layer of soil spread over the reinstated ROW is from the stockpiled topsoil and requires special care as it is this layer that generally determines the initial success of revegetation.

Hydrostatic Testing

The process of pressure testing the installed pipeline by filling and pressurising it with water (hydrostatic testing or hydrotesting) is a key component of the commissioning process.

Restoration of the ROW

At this point, construction of the pipeline has been completed and remaining works on site relate to restoring the ROW to its former grade, installing warning signs and removing construction materials. Areas of native vegetation will be rehabilitated using specialist advice from local experts and only using topsoil specifically set aside for areas of native vegetation. A line of sight and access will be maintained along the cleared pipeline easement.

The sequence of typical pipeline construction activities is shown below in Figure 3.



Figure 3 Typical pipeline construction activities

A short above ground section of pipeline (~130m) will also be constructed within the OGP fenceline to connect in with the pig receiver. The above ground pipe will be installed on pipeline supports (concrete foundations) at a depth of at least 500mm and spacing of approximately 5m. There will be approximately 25 pipe supports. Cranes will lift the pipeline and carefully lower it onto the supports.

Key operational activities:

The gas pipeline will operate continuously, and unscheduled outages are not expected. However, emergency line pipe, repair equipment and sufficient spares will be available in the event that urgent repairs are required.

The pipeline will be regularly patrolled and the cathodic protection system will be regularly tested for effectiveness.

Maintenance of the gas pipeline will include inspection surveys by vehicle along the pipeline and pigging* at regular intervals. If pigging detects any areas of concern, 'dig ups' of those pipeline sections may be required to enable visual inspections.

*An 'intelligent pig' is a pipeline inspection tool used to monitor and record the internal condition of the gas pipeline.

Key decommissioning activities (if applicable):

In the event that the pipelines are no longer required, they will either be decommissioned and mothballed, or abandoned:

- Decommissioning – depressurising the pipeline, then capping and filling it with an inert gas such as nitrogen or water with corrosion inhibiting chemicals at a slight overpressure. The cathodic protection would be maintained to prevent the pipe corroding and periodic inspections would ensure prolonged pipeline integrity.
- Abandonment – purging the pipe of natural gas, disconnecting it from the manifolds and removing all above ground facilities. The pipe would be cut at intervals to prevent inadvertent transfer of groundwater from one area to another. The pipe would then be left in place to corrode.

Recovering the pipe from the ground is unlikely to be a commercially viable option and would result in significant and unnecessary environmental and landowner impacts. A detailed rehabilitation and monitoring program would be developed and implemented in consultation with landholders and the regulator at the time of decommissioning and abandonment.

Is the project an element or stage in a larger project?

No Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

As stated previously, this pipeline project is part of the Halladale, Blackwatch and Speculant (previously Halladale and Blackwatch) Project; a gas field development project that was referred to the Victorian Minister for Planning in March 2011 (Referral Number 2011R-02). On 4 April, 2011 the then Victorian Minister for Planning decided that an Environment Effects Statement was not required for the Halladale and Blackwatch Development Project.

A number of project components of the Halladale, Blackwatch and Speculant Project have received statutory approval, including licences and consents for the drilling activities and site access under planning, petroleum and environmental legislation.

Minor upgrades are also required at OGP to receive the gas from the Halladale and Speculant fields. The scope of the modifications required are as per those described in the EE Act referral lodged in 2011 (Referral Number 2011R-02) including the installation of a new production separator. However it is yet to be confirmed whether mercury removal units will be required. These gas plant modification works are proposed to occur in July 2015 – March 2016. The emission levels (noise and air) associated with the proposed works at the OGP are predicted to be within the discharge limits specified in the licence conditions for the Plant. NOx emissions are not expected to change and volatile organic compounds will be within current discharge requirements. Further discussions will be held with EPA Victoria prior to construction.

The construction of two new sections of gas pipeline (approximately 9km) was also included in the previous referral documents submitted under State and Federal legislation. At the time the original EE Act referral (2011R-02) was lodged it was proposed that the MEG would be trucked from the gas plant to the well site.

Therefore given the proposed changes to the pipeline length, construction methods, alignment and the time since the initial referral was lodged, a consolidated pipeline project referral is being lodged for assessment.

Is the project related to any other past, current or mooted proposals in the region?

No Yes If yes, please identify related proposals.

4. Project alternatives

Brief description of key alternatives considered to date (eg. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

Use of the existing licensed gas pipeline

The Project previously included the re-use of the existing licensed gas pipeline to transport gas from the Croft tie-in point to the Heytesbury Gas Plant. At that stage of project development a new 50mm diameter MEG line was the only pipeline proposed for this central section of the alignment. However following the positive results of further exploratory drilling, Origin decided to construct a new gas pipeline to transport gas for the entire alignment from the well site to the OGP. Since this decision, Origin has worked to design the pipeline construction works so they remain within the area assessed for the previous MEG line replacement project.

In the long term, the current proposal to construct a new gas pipeline for the entire alignment will result in reduced impacts as less maintenance and 'dig-up' activities will be required.

Siting

The preferred pipeline alignment has been sited to maximise the use of the existing pipeline easement, except where it deviates at Curdies River. The pipeline alignment has been re-aligned in this section to avoid horizontal directional drilling in proximity to other pipeline infrastructure.

The proposed pipeline corridor was then reviewed by an ecology consultant (Biosis) to advise of the potential impacts of the preferred alignment. A field survey of terrestrial and aquatic values was undertaken and the pipeline was realigned or the construction ROW reduced, to avoid and minimise vegetation removal and retain areas identified as key habitat.

Whilst the study area has been highly modified through agricultural practices, there are some areas of significant vegetation along roadsides. Native vegetation removal will be minimized by either directional drilling or by reducing the width of the ROW.

Similarly the access routes for pipeline construction will be sited on existing access tracks and previously modified areas (where practicable) to minimise disturbance to vegetated and habitat areas.

As noted above, whilst the Project has changed to now include the installation of a new gas pipeline within the trench, the disturbance footprint, notably the area required for the construction right-of-way, remains unchanged from that initially assessed. Studies undertaken to date are on the same construction right-of-way as originally proposed.

Brief description of key alternatives to be further investigated (if known):

Following on from the siting exercise as outlined above, no further consideration of project alternatives (design, location or timing) is required.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

There are no other project stages or activities that have been excluded from this referral for the Halladale, Blackwatch and Speculant Project.

6. Project implementation

Implementing organisation (ultimately responsible for project, ie. not contractor):

Origin Energy Resources Limited

Implementation timeframe:

Project planning and consultation commenced in 2012 with pipeline construction targeted to commence during Q4 2015, subject to obtaining the necessary approvals.

The construction activities will take approximately 5-6 months to complete from commencement of construction to re-instatement. Construction work will take place typically between 6:00 am to 6:00 pm seven days per week.

The project plan is provided in Table 2 below, albeit timings may change as the project scope is finalised closer to construction.

Table 2 - Project Plan

Milestone	Date
Mobilisation of Pipe to site	Q4 2015
Pipeline construction	Q4 2015 – Q2 2016
Testing and commissioning	Q2 2016
Pipeline operational	Q3 2016

Proposed staging (if applicable):

It is proposed that the two horizontal directional drills to be undertaken at Curdies River will occur early in the construction program. For the remaining pipeline alignment, the contractor will determine the staging of project construction, and whether works are to commence at the well site or OGP. Alternatively there may be two construction work fronts operating concurrently.

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

No Yes If no, please describe area for investigation.
If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

Topography, landform, geology and soils

The proposed pipeline is within the South East Coastal Plain that consists of undulating Tertiary and Quaternary coastal plains and hinterlands that occur in several distinct segments (Warrnambool Plain, Otway Plain and Gippsland Plain subregions) rising up to 200 metres in altitude.

The project site occurs on an area of undulating limestone plain with coastal dune sand deposits present in the local area. The site is located in geomorphological unit 6.2.3; Karst plains with depressions (Warrnambool Plain subregion) of the Corangamite and Glenelg-Hopkins Catchment Management Regions. This geomorphological unit is characterised by a limestone plain which has developed many karstic features, particularly 'sinkholes'. These small limestone sinkholes vary between 20 and 100 m wide, with gently concave slopes and rounded margins.

Acid Sulphate Soils: Acid Sulphate Soils (ASS) could occur in localised low lying swampy areas such as the lower regions of Port Campbell Creek or in the lower reaches of Curdies River. Based on the Coastal Acid Sulfate Soils Distribution map for south west coast Victoria (Victorian Resources Online database – accessed 2014), the pipeline crossing at Curdies River is located within an area identified as 'prospective' (probable) ASS presence. ASS' are discussed further in section 14.

Native/exotic vegetation cover:

The project area is dominated by existing agricultural lands which have been extensively cleared for grazing and dairy farming purposes. As such, the ecological value of the project area is generally low. A typical view of the landscape traversed by the proposed pipeline route is shown in (Figure 4).



Figure 4 Introduced pasture grassland along pipeline alignment

Whilst the area along the pipeline route is predominantly cleared agricultural land, there are areas of significant vegetation near Callaghan's Road, in the roadside verge of East West Road (Damp Heath Scrub), and at the Timboon-Peterborough Road (Damp Heathy Woodland).

Remnant vegetation also persists along waterways within the study area (Biosis, 2014). Riparian and verge vegetation in the study area was recorded in poor condition, providing limited cover and habitat value for aquatic fauna. At Port Campbell Creek in stream modification/ restoration and bank revegetation was apparent. Vegetation along waterways is important as it serves to protect river banks from erosion and contributes to instream habitat.

Results of the various flora and fauna assessments of the project area undertaken by Biosis (April 2014, February 2014 and December, 2010) and Ecology and Heritage Partners in early 2015 are presented in further detail in sections 8, 11 and 12, with full copies of the reports provided as **Appendix A** (Biosis, 2014), **Appendix B** (Ecology and Heritage Partners, 2015) and **Appendix C** (Biosis, 2011).

Drainage and waterways

No permanent water flows exist in the immediate area of the pipeline from the well site to the tie-in point at Croft well, although ephemeral wetlands and drainage lines exist within the vicinity. Some of the larger sinkholes in the surrounding farmland may hold water for most of the year. Most sinkholes however are very porous and do not retain water.

The pipeline route crosses several named and un-named waterways, including: Spring Creek, Curdies River, Skull Creek, Leech Creek, two unnamed tributaries of Curdies River, Wallaby Creek and Port Campbell Creek. These creeks are generally degraded, flowing through exotic pasture with limited riparian vegetation (Biosis, 2010, 2014). A summary of results of the AUSRIVAS assessments of these watercourses are presented in Section 8.

The pipeline sections from the well site to Radfords Road are located within the boundaries of the Glenelg-Hopkins Catchment Management Authority. The remaining sections of gas pipeline to be constructed to connect to Heytesbury Gas Plant and then onto OGP, are located within the jurisdiction of the Corangamite Catchment Management Authority.

There are no wetlands of International importance (declared Ramsar Wetlands) in the vicinity of the Project.

Site area (if known): See route length and width.

Route length (for linear infrastructure) approximately 33km; **and width** - approximately 27 m for construction. Additional work spaces (i.e. pipeline laydown areas) can be up to 30m x 50m beyond the construction ROW. The width of the rehabilitated pipeline easement varies between 10 and 15m.

For the current field assessment, the study area consisted of a 200m corridor (100m either side of the proposed pipeline's centreline). A detailed habitat hectare assessment was conducted for an area of 50m either side of the pipeline. Although the additional work spaces may extend beyond this, no vegetation removal is required outside the area for which a detailed habitat hectare assessment was undertaken. Therefore the study area and vegetation assessment covers the additional work spaces (pipe laydown areas, truck turnaround areas) as well as indirect effects on adjacent areas of ecological value, such as those associated with increased sedimentation and habitat fragmentation.

Current land use and development:

Agricultural production (dairy and beef cattle grazing) is the predominant land use in the Moyne and Corangamite Shires. There is also horticultural crop growing in the southern and coastal areas of the municipalities.

There are currently up to 20 onshore gas fields in the Victorian section of the Otway basin. Major offshore fields in the Victorian section of the basin include La Bella, Minerva, Casino, Geographe and Thylacine.

Description of local setting (eg. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

Existing Land Use and Residences

Rural properties and farming practices are located along the proposed pipeline route. Port Campbell is the closest regional centre, located approximately 7km south of the Heytesbury Gas Plant. There is one dwelling within 50m of the proposed pipeline route.

Existing infrastructure

The Project intersects a number of roads in the area including the Great Ocean Road (also called Old Peterborough Road in this section), Callaghan's Road, Boundary Road and Timboon-Peterborough Road. Major roads intersected by the Project are shown in **Attachment 1**.

Planning context (e.g. strategic planning, zoning & overlays, management plans):

The proposed pipeline corridor extends from the Moyne Shire through to the OGP in Corangamite Shire.

The proposed pipeline will be constructed and operated in accordance with the provisions of the *Pipelines Act 2005*. Section 85 of the *Pipelines Act 2005* provides an exemption from the need to obtain planning permits under the *Planning and Environment Act 1987*.

However, Origin intends to comply with the intention of the local planning schemes for these council areas, including requirements under the Department of Environment, Land, Water and Planning (the then Department of Environment and Primary Industries' 'Permitted Clearing of native vegetation: Biodiversity Assessment Guidelines' (2013), with the development of an approved offsets strategy required to support approvals under the Victorian *Pipelines Act 2005*.

Strategic and Local Policy Framework

The Moyne and Corangamite Municipal Strategic Statements identify long-term strategic directions for land use and development in each municipality. A number of clauses of the State Planning Policy Framework and Local Planning Policy Framework (LPPF) are of relevance to the project relating to biodiversity, significant environments and landscapes, natural resource management and economic development.

The Corangamite LPPF specifically highlights the importance of oil and gas resource development to the region's economy (Clause 21.02 Key Influences). Similarly, Clause 19.03-6

Pipeline infrastructure aims to 'plan for the development of pipeline infrastructure subject to the *Pipelines Act 2005* to ensure that gas, oil and other substances are safely delivered to users ...at minimal risk to people, other critical infrastructure and the environment'.

Zones and Overlays

Pursuant to the Moyne and Corangamite Planning Schemes, the land proposed to be developed for the pipelines is within the following zones:

- Farming Zone (predominantly) - Moyne and Corangamite Planning Schemes;
- Special Use Zone 1 – Waarre Road, Port Campbell – Gas Processing Plant, Corangamite Planning Scheme;
- Special Use Zone 2 - Heytesbury Gas Facility, Timboon, Corangamite Planning Scheme;
- Special Use Zone 4 - Otway Gas Processing Plant; Corangamite Planning Scheme; and
- Road Zone 1.

Pursuant to the Moyne and Corangamite Planning Schemes, the following overlays apply to the land:

- Environmental Significance Overlay (ESO1) – Curdies River
- Vegetation Protection Overlay - Applies at Timboon-Curdievale Road, Timboon-Peterborough Road and Curdies River.
- Bushfire/ Wildfire Management Overlay – relevant to the study area where it connects to woodland, including east of Curdies River, and a section of East and West Road (Biosis, 2014).

Local government area(s):

The proposed Project is within the Moyne and Corangamite Shire Council boundaries.

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity

(cf. general description of project site/study area under section 7):

The regional landscape is characterised by a broad flat to gently undulating plain with low windswept heathland vegetation, contrasting with high vertical and rugged cliffs. The region is dominated by nutrient deficient soils and low calcareous dune formations over a limestone plain which has developed many karstic features, particularly 'sinkholes'.

Soils – ground conditions

Given the geology, ground conditions along the majority of the proposed replacement pipeline are expected to comprise a variable thickness of superficial soils overlying weathered limestone. Investigations near the western end of the pipeline route (near the well site) have encountered a thin (less than 0.5 metre) surface covering of silty sand overlying between four to five metres of sandy or silty clay over extremely weathered limestone. The depth to limestone is expected to vary over the pipeline route. As reported from geotechnical investigations conducted in April 2015, the samples taken from the alluvium areas (Curdies River) indicate this material is Potential Acid Sulphate Soil (PASS). The PASS is likely to generate acid, specifically when exposed to air and water and will need to be managed in accordance with soil management procedures to be defined in the Construction Environment Management Plan (CEMP).

Land Use

The project area is dominated by existing agricultural lands which have been extensively cleared for grazing and dairy farming purposes.

Native vegetation and habitat value

The desktop assessment and field survey of the study area identified areas of ecological value, primarily associated with watercourses and roadside vegetation. A total of ten Ecological Vegetation Classes (EVCs) were mapped within the study area. In total, 33.10 ha of native vegetation was mapped within the broader study area (50m either side of the proposed pipeline). Areas of highest quality were within road reserves and or along watercourses within the study area. Of note are the Lowland Forest along Old Sawmill Road, the patches of Damp Heathy Woodland along Squibbs and East and West Roads (Figure 5), and the patches of Heathy Woodland within Sodas Lane road reserve.



Figure 5 Damp Heathy Woodland; looking approximately west (Great Ocean Road - Old Peterborough Road).

These linear strips of vegetation, as shown in Figure 5 provide some connectivity between larger remnant patches of native vegetation in the area. These habitat corridors are potentially important to the persistence of fauna species in the broader area including *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species such as Southern Brown Bandicoot *Isodon obesulus obesulus* and Long-nosed Potoroo *Potorous tridactylus tridactylus*.

Ecology and Heritage Partners [EHP] (**Appendix B**) undertook further assessment of the areas of potential habitat value to these co-listed fauna species, confirming that the habitat areas previously identified by Biosis, provide foraging and breeding habitat for these co-listed species. However EHP also concluded these areas of potential habitat value exist within a broader area of higher quality habitat for these species. No Southern Brown Bandicoots or Long-Nosed Potoroos were recorded from these areas of potential habitat during the targeted surveys conducted in 2015.

Exotic species were relatively common throughout the study area. Common weeds recorded throughout the study area included Blackberry *Rubus fruticosus*, Cocksfoot *Dactylis glomerata*, Paspalum *Paspalum dilatatum* and Toowoomba Canary-grass *Phalaris aquatica*.

Results of the field surveys are presented in Biosis' flora and fauna assessment report presented as **Appendix A** and Ecology and Heritage Partners survey report (**Appendix B**).

Significant Species

Database searches (Protected Matters Search Tool, Victorian Biodiversity Atlas) were conducted to identify significant species recorded or predicted to occur within 5 km of the study area or from the relevant catchment (aquatic species). Those species recorded within the site or with a medium or higher likelihood of occurring in the study area were the subject of more detailed assessment and the development of specific mitigation measures. Based on detailed habitat assessments conducted in 2014, Biosis identified five species co-listed under the Commonwealth's EPBC Act and the Victorian FFG Act or DEPI Advisory List, to have a medium or higher likelihood of occurring within the study area: Square Raspwort (EPBC/ DEPI Advisory List), Southern Brown Bandicoot (EPBC/ FFG/ DEPI advisory), Southern Bent-wing Bat (EPBC/ FFG/ DEPI advisory), Long-nosed Potoroo (EPBC/ FFG/ DEPI advisory) and the Growling Grass Frog (EPBC/ FFG/ DEPI advisory). In addition, nine species listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) have a medium or higher likelihood of occurring within the study area, seven of these species being avifauna that may fly over or forage within discrete

habitat patches. The full results of these searches are presented in appendix 2 (flora) and appendix 3 (fauna) of Biosis Report (**Appendix A**). The terrestrial field survey included an assessment of physical presence of species (scats, tracks, diggings). No signs of these EPBC or FFG listed species or ecological communities were recorded from the 2014 field survey.

Given the medium or higher likelihood of occurrence and that the removal of some areas of potential habitat value could not be avoided, Origin commissioned further targeted fauna surveys for three co-listed species; Southern Brown Bandicoot, Long-nosed Potoroo and the Growling Grass Frog. This survey effort was undertaken in late Summer through Autumn (optimal survey timing) to assess the usage of the study area by the fauna species. None of the target species were recorded on site during the latest round of survey (2015). Due to the habitat value of the wetland located south of Squibbs Road, the Growling Grass Frog is considered to have a moderate likelihood of occurrence at that site. Based on the targeted surveys and detailed habitat assessments, the Southern Brown Bandicoot and Long-nosed Potoroo are considered unlikely to be present in the study area, or if present, in very low numbers (EHP, 2015 – Appendix B).

Aquatic Assessment – Hydrology, Water Quality, and Flora and Fauna

The aquatic assessment undertaken by Biosis included *in situ* water quality measurements, aquatic fauna survey and undertaking AUSRIVAS physical assessments at waterways. The entire pipeline crosses several named and un-named waterways, including:

- Spring Creek
- Curdies River
- Skull Creek
- Leech Creek
- two unnamed tributaries of Curdies River
- Wallaby Creek
- Port Campbell Creek.

The ecological values at Port Campbell Creek were assessed and reported in 2011 as part of the previous referral process associated with the new gas pipeline sections. However, as the construction method at this location has changed from horizontal directional drilling to open cut trenching, it was identified that a current survey of the watercourse crossing was required to inform the impact assessment and the development of mitigation methods (as reported in section 11 and 13).

Leech Creek, Skull Creek, Curdies River, an unnamed tributary of the Curdies River, Wallaby Creek and Port Campbell Creek were all found to contain habitat which supports native fish and decapod crustaceans (crayfish burrows). Biosis undertook field surveys for the target co-listed (EPBC/FFG/ DEPI) aquatic species; Yarra Pygmy Perch at Port Campbell Creek although only limited suitable habitat was present. No listed species were recorded from the targeted field surveys. All sites were relatively low in cover of aquatic macrophytes, with some regeneration of woody vegetation occurring at some sites.

As reported by Biosis (2014), alkalinity at the four sites that contained water at the time of the survey is elevated (albeit within the required range).

Indigenous Heritage Value

Specialist technical investigations and targeted archaeological field surveys have assessed various aspects of this project. These Aboriginal cultural heritage assessments have been undertaken by Ochre Imprints from 2009 to 2015, and involved:

- an Aboriginal cultural heritage assessment that included a field survey undertaken of private property and the Bay of Islands Coastal Park in advance of seismic testing for the Halladale project (Turnbull 2009);
- Cultural Heritage Management Plan (CHMP) 11593 (Barker 2011) of the two sections of the gas pipeline, which included a field survey and subsurface testing. The activity area for this CHMP also covers two pipeline sections covered in the current referral;
- Cultural Heritage Management Plan 12951 (Schell, Thomas & Tuechler 2014) of four dig up locations along the existing gas pipeline, which included a field survey;
- Cultural Heritage Management Plan 12952 (Schell 2014) of an access road in the western part of the study area. The access road had been subject to a previous CHMP (No.11593) but due to a change in the alignment of the road, another CHMP was

required.

A CHMP (No. 13060) is currently being prepared for the project which will conform to Schedule 2 of the *Aboriginal Heritage Act 2006*. The CHMP involved both field survey and subsurface testing components undertaken from October through to December 2014. Based on the current project development schedule, it is expected that the approved CHMP will be in place by August 2015. The draft CHMP (No. 13060) is presented as **Appendix D**.

No Registered Aboriginal Party has been appointed for the study area, which means the Office of Aboriginal Affairs Victoria (OAAV) will be the evaluation authority for this CHMP. OAAV has advised that the Eastern Maar Aboriginal Corporation has interests in the study area. This Aboriginal stakeholder will be involved in the preparation of CHMP 13060.

A review of the Victorian Aboriginal Heritage Register (VAHR) identified 11 Aboriginal places (stone artefact scatters and one site with shell midden material) within the activity area, with another four located within 200m of the activity area. Aboriginal cultural material, in the form of four stone artefacts, was recovered from the sub-surface testing program at Curdies River undertaken in December 2014. Two of these isolated stone artefacts (VAHR 7420-0052) are now located outside the proposed CHMP activity area.

The distribution of these Aboriginal places is shown in the map of registered places (**Attachment 2**).

A review of background information by Ochre Imprints for CHMP 13060 resulted in the development of some predictive statements relating to the archaeological sensitivity of the study area:

- stone artefact scatters are the most common type of Aboriginal place in the region, and are predicted to occur in the study area. Other types of Aboriginal cultural heritage (i.e. scarred trees, hearths, burials) are unlikely to occur in the study area, however their presence cannot be ruled out;
- Aboriginal places are most likely to occur adjacent to rivers, creeks and smaller drainage lines that occur throughout the study area and on karst landforms in the very western extent of the study area;
- the study area has been significantly disturbed by agricultural practices such as ploughing and the previous installation of a gas pipeline. This disturbance will have affected the context in which stone artefacts (or any other cultural heritage) may occur in a subsurface context. The exception to this is at Curdies River where deeper alluvial deposits, that have archaeological potential and are relatively intact, could occur.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

No Yes If yes, please provide details.

Sections of the proposed pipeline traverse through Crown Land at Curdies River and at unused road reserves.

Current land tenure (provide plan, if practicable):

The pipeline traverses freehold land (owned by private persons), and a series of Crown and public land parcels including a number of local roads (Great Ocean Road - also called Old Peterborough Road in this section), Callaghan's Road, Boundary Road and Timboon-Peterborough Road), and a series of watercourse crossings (Spring Creek, Curdies River, Port Campbell Creek and a number of unnamed tributaries).

Origin is liaising with the Department of Environment, Land, Water and Planning (DELWP) and the Corangamite Catchment Management Authority regarding Crown land matters and watercourse crossings, and with local council and VicRoads in relation to the proposed road crossings.

Intended land tenure (tenure over or access to project land):

Origin has existing registered pipeline easements which allow for the construction and operation

of pipelines. It is intended that the proposed pipelines will be constructed adjacent to the disused gas pipeline within existing easements held by Origin. Arrangements to facilitate construction and operation of the proposed replacement pipeline on public land will be agreed with Crown land departments, relevant agencies and public authorities.

Origin is also seeking approval under the *Pipelines Act 2005* for a new gas pipeline licence. New easements are also being sought.

Other interests in affected land (eg. easements, native title claims):

Construction access will be confirmed in consultation with landowners to ensure that disruption to existing land uses and farming practices is minimised as far as is practicable.

Origin has conducted a search of the land parcels associated with the proposed pipeline alignment and can confirm that Native Title has been extinguished for all areas, with the exception of Curdies River. Origin is in the process of securing approvals under the *Native Title Act 1993* for this area.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

The project is currently being considered under various Federal and State legislation:

Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999

Potential matters of National Environmental Significance (NES) were assessed in Biosis' Flora and Fauna Assessment (2014) and Ecology and Heritage Partners' targeted fauna survey (2015). An EPBC referral will be submitted to the Australian Department of the Environment (DoE). It is considered unlikely that the project constitutes a controlled action (Biosis, 2014; EHP, 2015).

Native Title Act 1993 – Approvals currently being sought.

State legislation

Pipelines Act 2005

Origin is currently progressing the application for pipeline licensing, including negotiation of new easements for the new gas pipeline. The application for a new pipeline licence was lodged in April 2015. The key approval documents required before construction of a pipeline can commence include:

1. Construction Environment Management Plan (CEMP). The CEMP will form the principal regulatory environmental document for this Project.
2. Construction Safety Management Plan.

Before the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR) can accept a CEMP, the following must occur:

- The CHMP must be accepted by the Registered Aboriginal Party or OAAV.
- The Offset Management Plan must be accepted by DELWP.

Planning and Environment Act 1987

Although exemption from planning controls are available for the pipeline under the *Pipelines Act 2005*, the objectives and requirements of each of these, notably objectives of DEPI's Permitted Clearing of native vegetation: Biodiversity Assessment Guidelines, will be considered and assessed including the identification of offset targets for any native vegetation removal.

Other key State approvals include (not intended to be the complete list of approvals) :

Legislation	Approval Required	Agency
<i>Aboriginal Heritage Act 2006</i>	Cultural Heritage Management Plan	Office of Aboriginal Affairs Victoria
<i>Water Act 1989</i>	Works on waterway permit.	Corangamite Catchment Management Authority
<i>Road Management Act 2004 and Local Government Act 1989</i>	Traffic Management Plan and Consent to conduct works on a road.	VicRoads and Municipal Councils.

The Project will also need to comply with the *Environment Protection Act 1970*, including relevant State Environment Protection Policies (SEPPs): SEPP (Waters of Victoria), SEPP (Groundwaters of Victoria), SEPP (Air Quality Management); and Noise in Regional Victoria (NIRV) publication 1411.

Have any applications for approval been lodged?

No Yes If yes, please provide details.

An application for a new pipeline licence was lodged with DEDJTR in April 2015. No other applications for approvals for the current Halladale, Blackwatch and Speculant - Pipeline Project have been lodged.

Approvals for the current drilling activities and works to the access roads to the well site (petroleum, planning and environmental) have been granted.

Approval agency consultation (agencies with whom the proposal has been discussed):

Origin has commenced consultation with the following State and Federal agencies:

- Commonwealth Department of the Environment
- Energy Safe Victoria
- DEDJTR - Earth Resources Regulation Branch
- DELWP - Impact Assessment Unit, and Planning and the Biodiversity Unit – Barwon South West region.
- Corangamite Catchment Management Authority
- Office of Aboriginal Affairs Victoria
- Moyne and Corangamite Shires

Other agencies consulted:

All agencies consulted to date are listed above.

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

A number of technical investigations have been undertaken by specialist consultants to address the potential impacts of the pipeline project. The specialist studies have included:

- Flora and Fauna (terrestrial and aquatic)
- Cultural Heritage

- Soils – desktop assessment
- Geotechnical (field) assessment

Whilst an overview is provided below, a more detailed summary of the key studies is presented in subsequent sections of this referral.

Flora and Fauna Assessment (Terrestrial Ecology)

Various studies have been undertaken to characterise the flora and fauna values within the study area. Previous ecological studies make reference to a central pipeline corridor and installation of a MEG pipeline. The current project description is based on the construction of a new gas pipeline for the entire length of the pipeline corridor from the well site to OGP. However whilst the type and number of pipelines to be installed within the trench has increased, Origin has worked to keep these works within the Construction RoW originally identified, thereby resulting in no change to the disturbance footprint and study area assessed.

Flora and Fauna Assessment (Biosis, 2014)

Although much of the existing physical environment throughout the project area has been modified by agricultural uses, detailed field assessments were undertaken to assess the project against State and Federal environmental legislation.

Terrestrial flora and fauna surveys of the well site and the two new sections of the gas pipeline were conducted by Biosis from late October 2008, 2009, 2010 and 2014. An assessment of aquatic habitat and waterways including Port Campbell Creek, was also conducted in December 2010. A list of studies is provided in Section 12.

As the central pipeline corridor had not been recently assessed, a flora and fauna assessment of the proposed alignment was undertaken in April and May 2014. In addition to characterising the ecological values of the study area, the report also identified a number of potential Project related impacts, including:

1. Native vegetation removal
2. Habitat fragmentation
3. Increased sedimentation and erosion
4. Potential impacts of noise, lighting and dust on significant fauna
5. Ability of native fauna to become trapped in an open trench

Native vegetation

As previously reported the project area is dominated by existing agricultural lands which have been extensively cleared for grazing and dairy farming purposes. The desktop assessment and field survey of the study area identified areas of ecological value, primarily associated with watercourses and roadside vegetation. A total of ten EVCs were mapped within the study area. In total, 33.10 ha of native vegetation was mapped within the broader study area (50m either side of the proposed pipeline).

Through realignment of the pipeline, reduction of the construction ROW around areas of significant vegetation and adoption of trenchless construction techniques under paved roads, the amount of vegetation proposed to be removed was reduced to approx. 1.7ha. Additional mitigation measures including para-webbing of significant vegetation and tree retention zones (buffers) will further reduce potential impacts on native vegetation as discussed in Section 12.

Commonwealth – EPBC/ FFG Co-listed Species

The flora and fauna assessment report provides an assessment of impacts for each of the EPBC listed species with a medium or higher likelihood of occurring within the study area. Whilst the study area provides suitable habitat for a number of EPBC/ FFG co-listed species (Square Raspwort, Southern Brown Bandicoot, Long-nosed Potoroo, Southern Bent-Wing Bat and Growling Grass Frog), Biosis determined that impacts are unlikely to constitute a 'significant impact'. The key mitigation measure adopted to reduce potential impacts has been to protect the habitat of these EPBC/ FFG listed species through the realignment of the proposed pipeline, reduction of the construction ROW or use of a trenchless construction technique to avoid removal of vegetation at waterways and roadsides. Biosis (2014) therefore concludes that, while some

significant species may use the project area on occasion, it does not provide important habitat for an ecologically significant proportion of any of these species. However, given that project design could not avoid all areas of potential habitat for 3 co-listed species; Southern Brown Bandicoot, Long-nosed Potoroo and Growling Grass Frog, further targeted field surveys were undertaken by Ecology and Heritage Partners (2015). None of the target species were recorded on site during the field survey.

Therefore the project is not expected to have significant impacts on any of the State or Nationally listed species identified as potentially occurring within the study area. Mitigation measures and requirements for pre-construction surveys are outlined further in section 12.

State (FFG) and DEPI Advisory Listed Species

Most of the land impacted by the proposed construction works is privately owned and not declared 'critical habitat' for the purposes of the FFG Act. Nine FFG listed species were identified as potentially occurring within the study area, although it was deemed that the study area does not provide critical habitat for any of these species. Seven of the nine species considered likely to use the area are avian species as identified in Table 3. Biosis therefore reported that whilst the study area is likely to form part of a broader range, there is limited foraging or breeding resources in the study area. Riparian or other wetland environments not subject to grazing by domestic stock also provide potential habitat for a range of other State listed rare species (Biosis, 2014). The full list of rare or threatened species' habitats (34 species in total) modelled in the study area are presented in table 3 of the Biosis report (**Appendix A**).

Given the likely level of impact to FFG and DEPI Advisory list species is predicted to be low, Biosis does not recommend any additional field survey or management measures for these FFG or DEPI Advisory List species.

Aquatic Assessment – Hydrology, Water Quality, and Flora and Fauna (Biosis)

Six of the eight watercourses field assessed within the study area (Leech Creek, Skull Creek, Curdies River, an unnamed tributary of the Curdies River, Wallaby Creek and Port Campbell Creek) were all found to contain habitat which supports native fish and decapod crustaceans (as indicated by crayfish burrows). As reported above, Biosis also undertook field survey for the EPBC /FFG co-listed target species; Yarra Pygmy Perch at Port Campbell Creek where limited habitat was recorded. No EPBC or FFG Act listed species were recovered from the bait traps or were recorded during the field assessment. Only one DEPI advisory list species, Otway Bush Yabby, was recorded from the field assessment.

All waterways have suffered some form of degradation, with all sites being affected by removal of native and riparian vegetation, and increased sedimentation. Habitat value was determined to be low – moderate at most waterways within the study area.

Open cut trenching is proposed for all waterway crossings other than Curdies River. These watercourses are expected to be dry, or very low flow and there is expected to be minimal environmental impact at the time of construction. The stream bed will be rehabilitated to its existing morphology post construction. Whilst Origin initially proposed to HDD the pipeline crossing at Port Campbell Creek (as per the commitment in the previous referral), Origin has subsequently determined that due to the previous disturbance regime at this site, the watercourse crossing will be trenched. Management measures are described in further detail in section 13.

Curdies River will be traversed by HDD, as it has been determined that open trenching could cause physical disturbance to the stream banks and open cut trenching would create downstream water quality impacts. A HDD management plan (or similar) will be required for this site to support the CEMP to be developed as part of the pipeline licencing process.

Where HDD is undertaken, a 10-m-wide buffer zone will be flagged around the section of watercourse and ground-disturbing works excluded from the riparian zone.

Cultural Heritage (Ochre Imprints)

As previously reported, 19 Aboriginal places occur within 200 m of the activity area. In addition, locations close to river, creeks and tributaries along the entire easement have been identified as having moderate archaeological sensitivity, along with karst landforms in the western part of the study area.

Further work undertaken to complete the CHMP included pedestrian survey and subsurface testing intended to identify Aboriginal cultural heritage and refine the zones of cultural heritage

sensitivity. This field work informed an analysis to determine whether Aboriginal places will be impacted by proposed works and to formulate site mitigation responses. These include measures to protect Aboriginal places from inadvertent damage and salvage requirements where impacts cannot be avoided. These management measures are outlined in the cultural heritage management plan (CHMP 13060) currently being developed (**Appendix D**).

This investigation methodology conforms to the requirements of the *Aboriginal Heritage Act 2006* for a Complex CHMP. The CHMP is scheduled to be in place by August 2015.

Soil Investigations

Acid Sulphate Soils

State Government's Coastal Acid Sulphate Soil Hazard Map for Mortlake T7421 and Port Campbell T7420 indicates that ASS may be encountered in the vicinity of Curdies River. As reported from geotechnical investigations conducted in April 2015, the samples taken from the alluvium areas (Curdies River) indicate this material is Potential Acid Sulphate Soil (PASS). The PASS will be managed in accordance with soil management procedures to be defined in the CEMP.

Erosion Susceptibility

With reference to the Corangamite Shire erosion susceptibility maps, the pipeline route is within an area with a generally Very Low to Low susceptibility to gully, sheet and rill erosion. However, some moderate sheet and rill erosion risk is present in the immediate vicinity of creeks, while a moderate gully erosion risk is present in the vicinity of Curdies River.

Regional Geohazards

Karst

The Port Campbell Limestone is known to be associated with the development of karst solution features, often giving rise to sinkhole development. Numerous surface depressions, considered to have formed as a result of sinkhole collapse, were observed and described during investigations in the vicinity of the western end of the pipeline route, in similar geological conditions. The potential for sinkholes to be present over the pipeline route is, therefore, assumed. The impacts from existing sinkholes and potential sinkhole development will be considered further in engineering development, particularly in the design of the proposed HDD at Curdies River.

Landslides

With reference to the Corangamite Shire Landslide Susceptibility map for the Port Campbell area, landslide susceptibility is generally Very Low to Moderate 1 over the pipeline route, with some higher risk (Moderate 2 and Moderate to High) zones in the vicinity of minor creek systems. Within the vicinity of Port Campbell Creek, the landslide risk is classified as High to Very High. Therefore there may be areas along the proposed pipeline route where localised small slips could occur.

Traffic

The pipeline corridor intersects a number of local roads. These roads are the Great Ocean Road (Old Peterborough Road), Callaghan's Road and Whiskey Creek Road in Moyne Shire, as well as Timboon-Curdievale Road, East and West Road and Timboon-Peterborough Road within the Corangamite Shire. Single lane closures may be required along these roads during pipeline construction. Traffic management plans will be prepared in consultation with local Council and VicRoads. Trenchless construction techniques (HDD) will be used to cross under sealed roads to minimise traffic impacts. Local access protocols will be developed and agreed with landowners and any affected local business operators.

Noise

Noise can result from ground disturbance activities associated with clearing of the construction ROW, general earthworks, loading and unloading of materials, and vehicle movements within the construction ROW. Noise and vibration can also result from trenching and backfilling, and trenchless construction techniques such as HDD.

Only minimal and short duration impacts are predicted to people who may be passing through the area at the time of construction or reside along the proposed pipeline route. Origin will work with landowners and occupiers to minimise interference from noise.

Construction will be undertaken during daylight hours and generally between 6am and 6pm seven days per week.

Air Quality

There will be minimal impact to air quality during construction and operation of the proposed pipeline. Sources of air emissions include particulates generated by operating construction machinery and vehicles, as well as fugitive dust generated from earthworks excavations, erosion of soil stockpiles, and from vehicles and machinery movement. Dust mitigation measures will be managed through implementation of the CEMP and will include measures such as speed limits and watering of soil stockpiles (where required).

Greenhouse Gas Emissions

Greenhouse gas emissions associated with pipeline construction and operation are negligible and short-term, and therefore not significant contributors to Victoria's or Australia's total emissions.

Social/ community related impacts

There are a number of rural properties along the pipeline route. Impacts on residents are expected to be minimal and limited to potential traffic related, noise or dust impacts during pipeline construction. There will be regular communication with landowners and potentially affected residents before, during and after construction. Landowners and residents will also have access to a complaints mechanism.

Origin will also continue to engage with landowners, local Council, VicRoads and State regulators, including DEDJTR.

In summary, no significant impacts are predicted as a result of the construction or operation of the proposed pipeline. The following mitigation measures have been implemented during the design phase to minimise impacts:

- Realign pipeline to avoid areas of ecological value (i.e. significant vegetation);
- Reduction in the construction ROW to avoid vegetation removal and habitat fragmentation;
- Use of trenchless construction techniques at sensitive crossings (Curdies River and paved roads);
- Timing of construction to avoid the wetter months, target base flow regimes in local watercourses and drier soil conditions to reduce potential sedimentation impacts.

As a minimum, the mitigation measures outlined in this referral and more site specific and contractor requirements, will be formalised in the Pipeline CEMP to be approved for the Project.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

NYD No Yes If yes, answer the following questions and attach details.

What investigation of native vegetation in the project area has been done? (briefly describe)

Biosis has conducted flora and fauna surveys at the site from October 2008, 2009, 2010, February 2014, and in April/ May 2014. Each of these has included flora and native vegetation assessments, incorporating a detailed habitat hectare assessment as required for 'moderate' risk pathway projects under DEPI's 'Permitted Clearing of Native Vegetation: Biodiversity Assessment Guidelines'. DEPI's Biodiversity Impacts and Offsets Requirements Report is presented in Biosis' Flora and Fauna Assessment Report (**Appendix A**).

What is the maximum area of native vegetation that may need to be cleared?

NYD Estimated area: 1.7 hectares (1.04 remnant patches, 9 trees)

The design stage considered all opportunities to avoid / minimise impacts to native vegetation. This is an estimate of the maximum amount of losses associated with pipeline construction from the well site to OGP (totalling approximately 33 km), including the construction ROW and additional work spaces associated with HDD, pipeline laydown areas and truck turnaround areas. Origin has confirmed that existing access routes will be used, with no requirement for road widening or native vegetation removal in these areas.

There may be minor changes to these clearance figures once the construction contractor is engaged. Any changes to the project footprint provided to Biosis in August 2014 would be confirmed by an ecological consultant prior to changes being made. A revised BIOR would be requested by DELWP if required.

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

N/A approx. percent (if applicable)

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

NYD Detailed assessment completed. If assessed, please list.

A total of ten EVCs were mapped within the study area for the proposed pipeline and may be potentially impacted by the Project activities. These EVCs are listed below in Table 4:

Table 4 Ecological Vegetation Classes potentially affected by the Project

EVC Name	EVC Number
Damp Heathy Woodland	Not described by DEPI within the Warrnambool Plain Bioregion, but commonly occurs in the neighbouring Victorian Volcanic Plain Bioregion (EVC 793).
Plains Sedgy Wetland	EVC 647
Damp Heath Scrub	EVC 165
Heathy Woodland	EVC 48
Damp-sands Herb-rich Woodland	EVC 3
Tall Marsh	EVC 821
Swamp Scrub	EVC 53
Lowland Forest	EVC 16
Swampy Riparian Woodland	EVC 83
Plains Grassy Wetland	EVC 125

Have potential vegetation offsets been identified as yet?

NYD Yes If yes, please briefly describe.

The outcome of DEPI's specific-general offset test is that a general offset can be used, assuming the offset is secured in the Corangamite or Glenelg-Hopkins CMA, or the Local Municipal District. Some offsets have already been identified within the Corangamite Catchment Management area, although these are to be confirmed by a botanist, with an Offsets Management Plan to be prepared for DEPI's approval as part of the pipeline licencing process. The Offsets Management Plan will be approved prior to any removal or disturbance to native vegetation.

Other information/comments? (eg. accuracy of information)

The vegetation assessment provided in the Biosis report was undertaken with a high degree of

accuracy being based on a habitat hectare assessment as required for a project determined by DEPI to have a moderate risk-based pathway.

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done?

(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

A series of flora and fauna assessments have been conducted in the study area from late 2008 through to 2015. These include:

- Speculant 3D Transitional Seismic survey (assessed area immediately adjacent to the proposed well site). Field survey conducted in November 2009.
- Halladale Black Watch Project: Flora and Fauna Assessment, including aquatic habitat assessment (Biosis Research 2011) (**Appendix C**).
- Review of the Net Gain Offset Prescription for Halladale and Blackwatch Project (Biosis 2013b).
- Halladale Black Watch Pipeline: Flora and fauna survey of five verification digs (Biosis 2014).
- Halladale and Speculant Project – MEG Pipeline: Flora and Fauna Assessment (**Appendix A**), Desktop assessment and field survey including habitat hectare assessment including native vegetation, terrestrial and aquatic flora and fauna assessment, and hydrology assessment.
- Halladale and Speculant Project, Targeted Fauna Survey (**Appendix B**) (**Ecology and Heritage Partners 2015**).

A flora survey was conducted at the site with a list of flora species collected for the entire study area (Biosis, 2014). A series of fauna surveys were also conducted on site. Surveys for terrestrial fauna were focussed on identifying areas of potential habitat value and the targeted survey for some species potentially impacted by project activities to inform a more robust significance assessment. All species of terrestrial fauna observed during the assessments were noted and active searching for fauna was undertaken. This included direct observation, searching under rocks and logs, examination of tracks and scats and identifying calls.

Ecology and Heritage Partners' undertook surveys for Southern Brown Bandicoot and Long-nosed Potoroo using remotely-triggered camera traps and adhered to the minimum survey requirements stated in the National Survey Guidelines for Australia's Threatened Mammals (2011). Similarly two rounds of survey (spotlighting, active searching and playback) were undertaken for the Growling Grass Frog at locations identified as providing suitable habitat.

Aquatic habitat assessments (including *in situ* water quality testing), aquatic fauna survey and AUSRiVAS physical assessments were undertaken at 10 sites along the proposed alignment (Biosis, 2014). Given some suitable fauna habitat at Port Campbell Creek, bait traps were deployed in accordance with the federal survey guidelines for Australia's threatened fish; Yarra Pygmy Perch. This EPBC listed species was not detected during the surveys and it is considered a low likelihood of occurring in the study area.

The study area also provides suitable habitat for DEPI advisory list species, with some listed species recorded from the 2009 and 2014 assessments, notably the Hardhead and the Otway Bush yabby.

Have any threatened or migratory species or listed communities been recorded from the local area?

NYD No Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

Based on Biosis' database searches [Victorian Flora Information System and the Protected Matters Search Tool (DoE)] eleven EPBC and FFG listed flora species have the potential to occur within 5km of the study area.

A search of the Victorian Biodiversity Atlas and the Protected Matters Search Tool (DoE),

identified 63 EPBC and FFG listed fauna species as potentially occurring within 5km of the study area, although it should be noted that many of these are marine species (i.e. Blue Whale, or coastal seabirds (i.e Little Tern), where no suitable habitat exists within the study area and therefore these marine species will not be impacted by the project. Appendices 2 and 3 of the Biosis report (**Appendix A**) detail the species and likelihood of occurrence. The location of each of these species in proximity to the proposed pipeline corridor is also shown in Figure 3.1 – 3.14 (flora) and Figure 4.1 – 4.14 (fauna) of the report.

A further 49 EPBC listed migratory species have been recorded within 5km of the study area (Biosis, 2014). Similar to the database search results for the EPBC and FFG listed species, many of these species are marine (whale, sharks, turtles or coastal bird species) and therefore would not be impacted by onshore pipeline construction.

A summary of those species recorded or with a medium or higher likelihood of occurring in the study area as reported by Biosis (2014) is provided below in Table 5. The results of the habitat assessments have also been updated to reflect the recent targeted fauna surveys.

Table 5 Summary of EPBC and FFG Act significant species, and DEPI Advisory List species most likely to occur in the study area.

Species Name	Area of value within the study area
EPBC Act/ FFG Act/ DEPI Advisory co-listed species	
Square Raspwort EPBC Act (vulnerable) DEPI Advisory List (vulnerable)	Possible in more protected riparian zones in the eastern section of the proposed pipeline alignment.
Southern Brown Bandicoot EPBC Act (endangered) FFG Listed DEPI Advisory List (near threatened)	Majority of the road reserves with a dense understory, particularly those associated with Damp Heathy Woodland, Heathy Woodland, Damp-sands Herb-rich Woodland, Damp Heath Scrub, Swamp Scrub and Lowland Forest. Areas of greatest importance include remnants that provide connectivity to larger patches of vegetation, including Dances Rd, Sodas Lane, Old Sawmill Rd, Whiskey Creek Rd, East and West Rd, and Squibbs Rd. Species not recorded on site in latest round of survey (2015). Based on the latest survey results, the Southern Brown Bandicoot is considered unlikely to be present in the study area, or if present, in very low numbers (EHP, 2015).
Southern Bent-wing Bat EPBC Act (critically endangered) FFG Listed DEPI Advisory List (endangered)	Potential to forage over the study area, particularly over woodland patches. No known roost sites occur within the study area.
Long-nosed Potoroo EPBC Act (vulnerable) FFG Listed DEPI Advisory List (endangered)	Larger patches of remnant vegetation. Typically associated with Heathy Woodland, Lowland Forest and Damp Heathy Woodland. Areas of greatest importance include Sodas Lane, Old Sawmill Rd, Whiskey Creek Rd and East and West Rd. Targeted survey for the west study area failed to detect the species in 2009. No suitable habitat within the eastern pipeline section. Species not recorded on site in latest round of survey (2015). Based on the latest survey results, the Long-nosed Potoroo is considered unlikely to be present in the study area, or if present, in very low numbers (EHP, 2015).
Growling Grass Frog	Large wetland south of Squibbs Road provides potential breeding

EPBC Act (vulnerable) FFG Listed DEPI Advisory List (endangered)	habitat. Potential habitat identified in creek north of Callaghans Rd, farmland adjacent to the west section of the alignment and adjacent to North South Rd and Port Campbell Ck in eastern section of alignment. Smaller creeks may be used for movement and dispersal. Targeted survey for east and west study area did not detect the species in 2009. Species not recorded on site in latest round of survey (2015).
FFG Act / DEPI Advisory co-listed species	
White-footed Dunnart FFG Listed DEPI Advisory List (near threatened)	Larger patches of Lowland Forest and Heathy Woodland. Targeted survey within west study area in 2009 failed to detect the species.
Grey Goshawk FFG Listed DEPI Advisory List (vulnerable)	Woodland patches.
Eastern Great Egret FFG Listed DEPI Advisory List (vulnerable)	Wetlands and creeks. Suitable but limited wetlands present throughout study area.
Rufous Bristlebird (Otways subsp.) FFG Listed DEPI Advisory List (near threatened)	Heathy vegetation with a dense shrub cover. Recorded from the Bay of Islands Coastal Park by Biosis (2009) – adjacent to well site.
Little Egret FFG Listed DEPI Advisory List (endangered)	Wetlands and creeks. Suitable but limited wetlands present throughout study area.
White-bellied Sea-Eagle FFG Listed DEPI Advisory List (vulnerable)	Study area likely to form part of broader range, however, there are limited foraging or breeding resources.
Baillon's Crake FFG Listed DEPI Advisory List (vulnerable)	Recorded on margins of wetland adjacent to Baileys Road (2009). Wetlands and creeks with dense vegetation.
Diamond Firetail FFG Listed DEPI Advisory List (vulnerable)	Woodland along road reserves and larger patches of remnant vegetation.
Swamp Skink	Un-named tributary of Curdies River.

No FFG or EPBC listed communities have been recorded within the study area during any of the field assessments undertaken (2008, 2009, 2010, 2014, 2015).

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (eg. loss or fragmentation of habitats) Please describe briefly.

The proposed Project has the potential to exacerbate the loss or fragmentation of habitats in this highly modified landscape. As previously reported, the results of the flora and fauna assessment were incorporated into the project design, with the flora and fauna mapping information combined with the engineering design drawings. Options were then investigated to retain as much of the mapped vegetation /habitats as possible (Biosis, 2014).

Whilst *Phytophthora cinnamomi* (cinnamon fungus) has not been recorded from the local area, movement of earthmoving equipment during the proposed works could potentially result in the

introduction of *Phytophthora*. The spread of this pathogen is listed as a potentially threatening process under the FFG Act. Whilst there were no signs of *Phytophthora* being present in the study area, vehicle hygiene procedures, including washdowns and inspections, will be implemented. These procedures will be detailed in the Pipeline CEMP.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

NYD No Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

Fauna Species

Biosis Research undertook a preliminary risk assessment for each of the state and nationally listed species that are deemed to have at least a medium likelihood of occurrence in the project area. A medium level of likelihood was assigned where there are "records of terrestrial species within 5km of the site or of aquatic species in the relevant basin/neighbouring basin but habitat limited in its capacity to support the species due to extent, quality or isolation" (Biosis, 2010).

This assessment, presented in section 6 of Biosis' current assessment (**Appendix A**) reports the impact categories and mitigation measures for the Southern Brown Bandicoot (EPBC/ FFG listed), Long-Nosed Potoroo (EPBC/ FFG listed), Southern Bent-wing Bat (EPBC/ FFG listed), and the Growling Grass Frog (EPBC/ FFG listed). The extent of vegetation/habitat clearing has been minimised through project design. Priority was given to highest value areas and retaining larger vegetation patches. Removal of potential habitat is relatively minor compared to the overall available habitat in the surrounding landscape (Biosis, 2014). With these mitigation measures in place, Biosis reports that impacts to these species are unlikely to constitute a significant impact, however a referral will be made under the Commonwealth EPBC Act. In addition the management recommendations for construction works (i.e. 'no go' zones, buffers around wetland habitat, pre-clearance surveys, etc) will be implemented for the project. These measures will be detailed in the CEMP.

However as some areas of potential habitat value could not be avoided, Biosis recommended further survey for three of these co-listed species; Southern Brown Bandicoot, Long-nosed Potoroo and the Growling Grass Frog. Following targeted survey and more detailed habitat assessments, the significant impact assessment was confirmed to note the project is not likely to have a significant impact on any of the fauna species surveyed.

Flora Species

The proposed pipeline route is largely on private land used for agricultural purposes. However, as per the pre-construction surveys undertaken at the well site, the presence of protected species, notably the EPBC listed Square Raspwort will be confirmed by a qualified botanist prior to construction.

Is mitigation of potential effects on indigenous flora and fauna proposed?

NYD No Yes If yes, please briefly describe.

The primary mitigation measure undertaken during the siting and design phase has been to avoid and minimise vegetation removal, thereby protecting fauna habitat. Similar to the preventive measures undertaken for the well site construction, a suitably qualified ecologist would be engaged to undertake a pre-clearance survey, para-web significant vegetation and undertake active searches for significant species, including the EPBC/ FFG listed Square Raspwort that may still occur within the riparian zone.

As reported by EHP (2015), any impacts to the co-listed Southern Brown Bandicoot, Long-nosed Potoroo and Growling Grass Frog are unlikely to constitute a significant impact.

A series of recommendations and mitigation measures have also been outlined in Biosis' assessment report and will be incorporated into the pipeline CEMP, including:

- Establishment and fencing of no-go zones to avoid disturbance to areas of significant habitat value.
- Avoid removal of native vegetation, in accordance with DEPI's Permitted Clearing Guidelines.

- Implementation of HDD at Curdies River and under sealed roads.
- Avoid impacts to fauna habitat. This can be achieved through fencing access tracks within 200 metres of wetlands to reduce potential impacts to the Growling Grass Frog. This should include use of sediment fencing, acting as fauna proof fencing as well, buried into the ground and secured at regular intervals. This fencing will be constructed prior to commencement of construction works and will be regularly maintained.
- Install egress ramps and cargo netting in open pipeline trenches for all fauna to exit the trench. Origin's contractors will also conduct daily observations each morning to check for fauna that may have fallen into the trench overnight. A qualified fauna handler will be on call to remove and relocate any trapped fauna.
- Restrict construction activities to daylight hours.
- Weed control measures, including washdown procedures and vehicle inspections.

Other administrative and preventive measures will be implemented through the pipeline CEMP including:

- site induction and monitoring requirements
- waste management procedures
- weed and pathogen management protocols
- rehabilitation plans, including revegetation of disturbed areas, and restoration of stream banks and beds to their previous forms/ morphology.

Other information/comments? (eg. accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (eg. > 1 GI/yr)?

NYD No Yes If yes, indicate approximate volume and likely source.

It is predicted that approximately 1.1ML of fresh water will be required for pipeline construction and hydrotesting. Water required for pipeline construction will be sourced from the mains water supply.

Will the project discharge waste water or runoff to water environments?

NYD No Yes If yes, specify types of discharges and which environments.

Hydrotest water will be passed from test section to test section and will be released onto pasture via a straw bale and geotechnical fabric filter or equivalent. Should oxygen scavenger be used, the hydrotest water will be aerated before disposal. Water will not be released to aquatic environments or near drainage lines.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

NYD No Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

Waterways

The proposed pipeline crosses several named and un-named waterways, including: Spring Creek, Curdies River, Skull Creek, Leech Creek, two unnamed tributaries of Curdies River, Wallaby Creek and Port Campbell Creek. These waterways are generally degraded, flowing through exotic pasture with limited riparian vegetation (Biosis, 2010). Some areas have been revegetated.

Whilst it's considered unlikely that waterways will be detrimentally impacted by the proposed pipeline construction, there is still potential for contamination of surface water environments due to accidental release of drilling muds (bentonite) used for HDD, poor construction techniques, inappropriate storage of chemicals and/or as a result of a major chemical spillage, or from ineffective waste management practices. Associated potential impacts include:

- Increased turbidity due to sediment run-off.
- Increased sediment load, deposition and contamination from loss of containment of drilling fluid or mud.

- Reduced surface water quality.
- Reduced aquatic biodiversity.
- Reduction in stream flows where it is used for hydro testing.
- Change in local surface drainage patterns.
- River bank instability

Sources of potential contamination will be strictly managed and therefore the risk of contamination of the site and surrounding water environments are considered low.

Construction activities will occur during drier months when rainfall is low. This will ensure that erosion and sedimentation through run-off is minimised. Stockpiles will also be located away from waterways or drainage lines. All project activities will cease during periods of high rainfall to reduce the likelihood of erosion and sedimentation occurring.

Specific erosion and sedimentation measures will be defined in the Pipeline CEMP to be approved under the *Pipelines Act 2005*.

Wetlands

There are numerous sinkholes throughout the project area that provide habitat for native fauna. In particular the 'sinkholes' provide habitat for water birds and frogs, including the potential for significant species, as discussed previously. Wetlands with the potential to provide suitable fauna habitat, notably the wetland identified adjacent to Squibbs Road will be fenced with a terrestrial buffer established to prevent potential impacts to habitat values. Sediment fencing will prevent sediment laden run-off from being flushed into wetland habitat (breeding habitat).

Although there may be some interaction with aquatic environments, Biosis and EHP predict that, assuming the proposed mitigation measures are applied, the level of impact is predicted to be low.

Are any of these water environments likely to support threatened or migratory species?

NYD No Yes If yes, specify which water environments.

There is limited suitable habitat present in the alignment for the Yarra Pygmy Perch and the Australian Grayling. Targeted bait trapping for the Yarra Pygmy Perch failed to detect this species during field assessments.

Curdies River is estuarine at the alignment with the watercourse providing some habitat for threatened Pipe Fishes (Family Sygnathidae). The proposed pipeline crossing at Curdies River will be HDD avoiding impacts to aquatic fauna.

The large wetland south of Squibbs Road and the creek north of Callaghans Rd (unnamed tributary of Curdies River) were found to contain potential habitat for the Growling Grass Frog.

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

NYD No Yes If yes, please specify.

As reported by Biosis (2014), the study area does not drain directly into any Ramsar site and the development is not likely to result in any impact on this matter of NES.

Could the project affect streamflows?

NYD No Yes If yes, briefly describe implications for streamflows.

Potential impacts to streamflows are predicted to be minimal as construction will occur in drier months, when some of the watercourses identified in the recent survey are unlikely to be present. If streamflows are present at the time of construction (Port Campbell Creek is perennial), open trenching will be undertaken in coffer dams to isolate the construction ROW. Any impacts to streamflows will be short term and temporary (in the order of 24hrs).

Water will not be extracted from local watercourses for use in pipeline construction or hydrotesting.

Could regional groundwater resources be affected by the project?

NYD No Yes If yes, describe in what way.

Potential impacts to regional groundwater resources are not envisaged.

However, shallow groundwater may be encountered in the project area and has been reported for the area, particularly near Port Campbell Creek. There is potential for localised contamination of flow impacts to this groundwater due to:

- Intersection of HDD boring at Curdies River with an existing fracture or cavity in the limestone or surficial gravels.
- Alteration of local groundwater flow patterns due to intersection of the groundwater table. This may occur in the eastern section of the pipeline (i.e. Port Campbell Creek) where a shallow groundwater table has been recorded.
- Trench inflows/dewatering impacting on groundwater dependent ecosystems or groundwater users

The potential for groundwater impacts is reduced by the use of:

- Water based additives
- Wadding or equivalent into the HDD hole if necessary to address the presence of fractures or cavities.

Could environmental values (beneficial uses) of water environments be affected?

NYD No Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)

Pipeline construction has the potential to result in direct and indirect (i.e. sediment run-off) impacts to watercourses and their beneficial uses. Given the previous disturbance regime from pipeline construction or agricultural activities, and that most watercourses in the study area are ephemeral, Biosis recommends that open cut trenching be adopted at all watercourses, including Port Campbell Creek, except for Curdies River where HDD is proposed and Skull Creek where a linear strip of riparian vegetation remains.

Erosion and sediment controls will be implemented where there is the potential for sediment-laden run off to impact on downstream water quality. There will also be post-construction monitoring of some watercourses, including turbidity monitoring after rainfall events. These measures will be outlined in the water quality monitoring plan that will be developed as part of the pipeline CEMP.

Could aquatic, estuarine or marine ecosystems be affected by the project?

NYD No Yes If yes, describe in what way.

No estuarine or marine ecosystems are predicted to be impacted by the project. Curdies River is estuarine at the proposed site of the pipeline crossing, however this crossing will be HDD, with no impacts to surface water impacts expected.

Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term?

No Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.

Potential impacts on habitat values and the aquatic environment are expected to be minor given the short term nature of pipeline construction, timed to occur in drier months to avoid potential erosion and sedimentation impacts.

Is mitigation of potential effects on water environments proposed?

NYD No Yes If yes, please briefly describe.

HDD will be used under Curdies River to avoid impacts to the waterway. In addition, a number of control measures will be implemented to avoid turbid run-off or potential impacts of erosion for all water environments. These measures will be stipulated in the Pipeline CEMP, but likely to include the following:

- Overland flow will be diverted around stockpiles (topsoil, subsoil and erodible

construction materials such as road base) by installation of upslope diversion drains, if local topographic conditions require such diversion drains.

- Stockpiles of topsoil, subsoil or any erodible construction material will not be located within 50m of the boundary of any watercourse, or in any areas subject to concentrated water flow.
- Sediment fencing will be installed immediately downslope of the construction area and all stockpiles of soil and erodible construction materials. Sediment fencing will be positioned so that it does not intercept runoff water from upslope diversion drains.
- Erosion and sediment controls will be inspected weekly and after each rainfall event resulting in >20mm in 24 hrs. Erosion and sediment controls will be repaired and reinstated as required.
- Riparian vegetation will also be avoided, and fenced where appropriate to prevent physical disturbance i.e trampling.
- Fencing of wetland habitat established to avoid sedimentation impacts.

Other information/comments? (eg. accuracy of information)

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?
 No Yes If yes, please attach.

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**
 NYD No Yes If yes, provide plan showing footprint relative to overlay.

The new section of gas pipeline to be constructed from the well site for the Halladale and Speculant Project is adjacent to an Environmental Significance Overlay (ESO) given its proximity to coastal areas.

Curdies River is also covered by an ESO as shown in **Attachment 3**. It is proposed that the pipeline is HDD underneath this watercourse avoiding impacts to stream banks and downstream water quality.

- **Identified as of regional or State significance in a reputable study of landscape values?**
 NYD No Yes If yes, please specify.

The proposed pipeline route crosses the Great Ocean Road (section also referred to as Old Peterborough Road). However this section of road is set back from the Coast (approximately 2.5km) and there are not expected to be any impacts on coastal views at this location. This road crossing will also be HDD to minimise visual and traffic related impacts. A Landscape Significance Overlay has not been applied to this road zone.

- **Within or adjoining land reserved under the *National Parks Act 1975* ?**
 NYD No Yes If yes, please specify.

The drilling component of the Halladale and Speculant Project required approval under the *National Parks Act 1975*. Approvals under this Act have been granted. There are no approval requirements under this Act associated with the pipeline component of the Project.

- **Within or adjoining other public land used for conservation or recreational purposes ?**
 NYD No Yes If yes, please specify.

The pipeline will extend through Crown land. As reported previously, the proposed pipeline traverses a number of watercourses. Of note is the Curdies River crossing that will be HDD to minimise any downstream impacts or to the stream banks. There is minimal riparian vegetation (scattered tress) at this stream crossing.

Is any clearing vegetation or alteration of landforms likely to affect landscape values?

NYD No Yes If yes, please briefly describe.

In addition to the native vegetation removal proposed, site levelling will also be required prior to excavating the pipeline trench. This is of such a minor extent, that it is not expected to impact on landform characteristics of the area.

Is there a potential for effects on landscape values of regional or State importance?

NYD No Yes Please briefly explain response.

Is mitigation of potential landscape effects proposed?

NYD No Yes If yes, please briefly describe.

Pipeline construction will be sited to avoid removal of native vegetation wherever possible. Where areas of native vegetation need to be cleared, this 'native topsoil' will be stockpiled separately from that originating from previously cleared or agricultural land. Disturbed areas will be rehabilitated to be consistent with surrounding areas.

Other information/comments? (eg. accuracy of information)

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils**Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?**

NYD No Yes If yes, please briefly describe.

Acid Sulphate Soils are expected to be present within the vicinity of Curdies River, and will be considered during any excavations in that area.

The soils along the pipeline route are generally classified as possessing very low or low erosion potential, except in the vicinity of creeks, where a moderate potential is present. Erosion is not expected to be a material concern for the proposed pipeline alignment.

Are there geotechnical hazards that may either affect the project or be affected by it?

NYD No Yes If yes, please briefly describe.

The Port Campbell Limestone is associated with karst development and sinkholes have been observed within the vicinity of the pipeline route. The impact of karst will be addressed as part of the detailed design process, particularly at Curdies River where HDD is proposed.

The area around the Port Campbell Creek is associated with high landslide potential. However, Origin has determined that only localised small slips could occur as a result of the pipeline works at the proposed crossing location.

Other information/comments? (eg. accuracy of information)

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

NYD No Yes If yes, provide estimate of traffic volume(s) if practicable.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

NYD No Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

Traffic

Construction works will result in localised traffic impacts from construction equipment and vehicles, and delivery and removal of construction materials.

The pipeline route will cross a number of roads, namely Great Ocean Road (also called Old Peterborough Road), Callaghan's Road, Boundary Road and Timboon-Peterborough Road. Where road crossings are necessary, works will be carried out to minimise disruptions to traffic and designed to suit local environmental conditions. VicRoads has requested HDD or tunnel boring underneath road crossings, with a minimum cover of 1200mm.

Interference with local users and residents through increased traffic movements on local roads is expected to be minimal. Origin estimates there will only be an additional movement on average, of 2 heavy haul vehicles per day, plus an additional 10 light vehicle movements per day to transport workers and inspectors. The majority of construction traffic will be confined to the construction ROW. Traffic to the construction site will be managed through a traffic management plan.

Project specific speed limits will be adhered to. Speed limits are typically:

- 40 km/h on unsealed tracks; and
- Statutory speed limits on sealed roads unless reduced at locations specified in the traffic management plan.

A traffic management plan will be developed and implemented in consultation with the designated road authority; VicRoads, and/or the Moyne and Corangamite Shire Councils.

Noise

Noise levels will be low, with truck movements restricted to day-time hours so that impacts to residents are expected to be negligible.

Air Quality

Existing air quality in the project area is likely to be good, although dust from agricultural activities may occasionally create poor conditions over a short duration. The following measures will be adopted to avoid potential impacts to local air quality conditions:

- Construction vehicles and other internal combustion equipment will be appropriately maintained to minimise greenhouse gas emissions and air pollution.
- Where required, dust control measures will be implemented which may include the use of water trucks.
- Where works are conducted near residential dwellings, care will be exercised to ensure that the risk of adverse dust and air quality impacts at the receptor are minimised. This may include a reduction in speed limit for construction vehicles.

The management measures identified above will be formalised in the Pipeline CEMP.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

NYD No Yes If yes, briefly describe the hazards and possible implications.

The majority of the pipeline traverses grassed paddock areas, which is considered a category 1 (low risk) source of fuel. However, the section of gas pipeline connecting to the well site is in proximity to a number of "shrub and heath" vegetated areas which is a category 2 fuel source and carries a higher risk of bushfire.

With mitigation measures, the likelihood of a pipeline rupture occurring and sparking a bushfire, is considered low. Further information relating to the safety study will be provided in the Pipeline Safety Management Plan. Discussions will also be undertaken with Energy Safe Victoria and the local CFA.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

NYD No Yes If yes, briefly describe potential effects.

Minor interference to landowner properties and farming operations is anticipated during pipeline construction. No acquisition of residential properties is required.

Are non-residential land use activities likely to be displaced as a result of the project?

NYD No Yes If yes, briefly describe the likely effects.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

NYD No Yes If yes, briefly describe the potential effects.

Is mitigation of potential social effects proposed?

NYD No Yes If yes, please briefly describe.

The Project's Pipeline Consultation Plan no. S4600AN70226015 has been approved by the DEDJTR. Whilst specific measures will be required on some properties, they generally include:

- Movement of livestock from paddocks as required.
- Construction times to avoid peak agricultural activities and seasons.
- Pipeline to follow fencelines wherever practicable.
- All construction gates shall be kept shut when not in use. Farm gates must be left as found.
- Gates and fencing will be maintained and reinstated to a condition equal or better than the pre-existing condition.
- Consideration will be given to the use of temporary fencing to exclude access to the trench by livestock.
- Stock routes will be avoided as far as practicable.

Origin will also continue to consult with local stakeholders to identify and minimise any potential impacts.

Other information/comments? (eg. accuracy of information)

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

No If no, list any organisations that it is proposed to consult.
 Yes If yes, list the organisations so far consulted.

OAAV has been consulted regarding the project's development. A Notice of Intent to prepare a CHMP for the proposed pipeline construction has been lodged.

Indigenous groups consulted to date include Eastern Maar Aboriginal Corporation and Kuuyang Maar Aboriginal Corporation. At the time of preparation of this referral, there was no Registered Aboriginal Party for the project area.

What investigations of cultural heritage in the project area have been done?

(attach details of method and results of any surveys for the project & describe their accuracy)

Four Aboriginal archaeological investigations have been undertaken for various aspects of this project. The method, coverage and results of these are briefly summarised below:

Turnbull (2009) involved a sample field survey of the area subject to seismic testing, over the very western extent of the study area. The cultural heritage assessment identified four Aboriginal places (VAHR 7420-0045, VAHR 7420-0046, VAHR 7420-0047 and 7420-0048), which aside from VAHR 7420-0045, contained stone artefacts. VAHR 7420-0045 contained stone artefacts and shell midden material.

The assessment identified two zones of archaeological sensitivity: the coastal margin had high archaeological sensitivity while the inland karst landform was rated as having moderate archaeological sensitivity.

Barker (2011) examined two sections of the gas pipeline, which included a sample field survey and sample subsurface testing. No Aboriginal cultural heritage was identified during the field survey, however two stone artefacts were uncovered during a subsurface testing program. These were identified on karst landforms in the western margin of the study area and registered as VAHR 7420-0049.

Two zones of archaeological sensitivity for the sections of pipeline were defined: karst landforms in the western margin of the study area were identified as having moderate archaeological sensitivity, while the remainder of the area was identified as having low archaeological sensitivity.

Schell, Thomas and Tuechler (2014) prepared a CHMP for four dig up locations along the existing gas pipeline. The CHMP included a field survey of each dig up location. No Aboriginal cultural heritage was identified during the field survey, however background research established that two Aboriginal places (VAHR 7420-0025 and 0026) occurred within the dig ups.

Two zones of archaeological sensitivity for the dig ups were defined: the known and predicted extents of VAHR 7420-0025 and 0026 were identified as having moderate archaeological sensitivity, while the remainder of the area was identified as having low archaeological sensitivity.

Schell (2014) prepared a CHMP for an access track associated with the western margin of the gas pipeline. The CHMP did not involve a field survey, as the location of the track had been subject to a previous CHMP (Barker 2012). The CHMP did determine that VAHR 7420-0047 occurred in the activity area for CHMP 1952.

CHMP (13060) is currently being prepared for the activity area associated with the new gas pipeline. The evaluation method for this CHMP involved background research, a field survey and a program of subsurface testing.

Is any Aboriginal cultural heritage known from the project area?

NYD No Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register:
All Aboriginal places identified comprise flaked stone artefacts.
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby:
Areas of moderate archaeological sensitivity have been identified: around registered Aboriginal places; land close to rivers, creeks and tributaries along the entire easement; and, a karst landform which occurs on private property in the very western section of the study area.
- Sites or areas of sensitivity identified by representatives of Indigenous organisations:
N/A.

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

NYD No Yes If yes, please list.

The Great Ocean Road is a listed heritage site (VHR H2261) under the *Heritage Act 1995*.

Is mitigation of potential cultural heritage effects proposed?

NYD No Yes If yes, please briefly describe.

There will be no physical disturbance to the Great Ocean Road as this road crossing will be directionally drilled. A permit exemption will be sought from Heritage Victoria for these works.

Other information/comments? (eg. accuracy of information)

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

- Electricity network. If possible, estimate power requirement/output
- Natural gas network. If possible, estimate gas requirement/output
- Generated on-site. If possible, estimate power capacity/output
- Other. Please describe.

Please add any relevant additional information.

On site diesel generators and combustion engines to power construction equipment.

What are the main forms of waste that would be generated by the project facility?

- Wastewater. Describe briefly.

Waste water will be collected in sumps and trucked off site for treatment at designated treatment facilities.

The contractor will be responsible for establishing sewage management practices for the construction workforce.

- Solid chemical wastes. Describe briefly.

Drill cuttings at HDD crossings

Cuttings will be collected in cuttings bins or lined pits and treated in accordance with one of the methods identified above. Depending on type of mud used for the section drilled (water based) cuttings may be used for composting or direct return to landfill.

- Excavated material. Describe briefly.

The main waste stream from pipeline construction will be excavated trench spoil.

Detailed design will seek to minimise the amount of existing material to be excavated.

Uncontaminated soil will also be set aside in defined areas for later use as fill.

- Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

General Wastes

Waste management will be undertaken in accordance with the following waste management hierarchy:

- Minimising waste sources;
- Recycling wherever practicable; and
- Minimising waste volumes.

Construction scrap will be reused or recycled wherever practicable. Construction wastes which cannot be reused or recycled onsite will be removed for offsite disposal at an approved disposal facility.

Domestic waste consisting of non-hazardous solid waste will be stored in lidded bins prior to collection and disposed offsite at licenced facilities. These wastes will be stored such that the ingress of pests and vermin is prevented. General wastes will be separated where practicable for recycling.

Other hazardous wastes that are generated will be appropriately stored in a sheltered and bunded area prior to disposal by a licensed contractor at a licensed facility.

Contractors will be required to prepare waste management procedures in accordance with Origin's pipeline CEMP.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

- Less than 50,000 tonnes of CO₂ equivalent per annum
- Between 50,000 and 100,000 tonnes of CO₂ equivalent per annum
- Between 100,000 and 200,000 tonnes of CO₂ equivalent per annum
- More than 200,000 tonnes of CO₂ equivalent per annum

Please add any relevant additional information, including any identified mitigation options. Greenhouse gas emissions associated with pipeline construction and operation are negligible and short-term, and therefore not significant contributors to Victoria's or Australia's total emissions.

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

No Yes If yes, briefly describe.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

Siting: Please describe briefly

The preferred pipeline alignment was selected on the basis of maximising the use of an existing, pre-disturbed pipeline easement thereby reducing the extent of land disturbance required. The preferred pipeline route is largely located on private property, with limited native vegetation removal. Land uses such as agriculture, primarily grazing and cropping will continue after construction and during operation of the gas pipeline.

Design: Please describe briefly

The following design features and construction methods have been adopted, in order to reduce land disturbance and environmental impacts:

- The pipeline alignment has been designed to minimise the excavation of material, such as the reduction of the construction ROW to avoid sensitive ecological areas.
- Trenchless construction techniques (i.e HDD) adopted to avoid impacts to Curdies River.

Environmental management: Please describe briefly.

An approved Pipeline Construction Environment Management Plan (CEMP) will be implemented to minimise impacts upon environmental values present within the study area. The CEMP will include:

- site induction and monitoring requirements
- sedimentation management
- waste management procedures
- weed and pathogen management protocols
- rehabilitation plans, including retention of scattered indigenous trees (where possible) and revegetation of disturbed areas.

The following management procedures will also be adopted by Origin and its contractor during construction:

- Pipeline alignment drawings will be used to identify environmental sensitivities determined from field surveys.
- Compliance with the management measures as detailed in the approved CEMP.
- Origin will undertake periodic audits of the contractor's environmental performance.

Other: Please describe briefly

Add any relevant additional information.

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

NYD No Yes If yes, briefly describe.

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

No Yes If yes, please list here and attach if relevant.

Has a program for future environmental studies been developed?

No Yes If yes, briefly describe.

Findings of technical assessments have informed the preparation of this referral. However, as previously described, further study and assessment will continue as follows:

- Offsets Management Plan
- Depending on the outcomes of the works on waterways permitting process (*Water Act 1989*) additional hydrological and water quality assessment may be required prior to construction, including the development of a water quality monitoring plan.
- Cultural Heritage – completion of the CHMP, incorporating feedback from Eastern Maar and OAAV.

Consultation program

Has a consultation program conducted to date for the project?

No Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

The Pipeline Consultation Plan no. S4600AN70226015 has been approved by DEDJTR for the new gas pipeline. The Plan outlines the formal engagement process with affected landowners and occupiers under the *Pipelines Act 2005* and details Origin's consultation commitments throughout the life of the Project.

Has a program for future consultation been developed?

NYD No Yes If yes, briefly describe.

Origin will continue its stakeholder consultation through the following measures:

- Ongoing meetings of the Community Reference Group.
- Periodic updates with key stakeholders which may potentially be affected by the project.
- Periodic updates to key regulatory bodies and stakeholders in relation to changes in project scope and timing.
- An Origin representative will be onsite to liaise with any stakeholders present in the project area.

Authorised person for proponent:

I, Richard McNally,

Origin Energy-Project Manager Halladale and Speculant Project, confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 22/06/15

Person who prepared this referral:

I, Sean Matthew Dunn,

Origin Energy -HSE Team Lead Halladale & Speculant Project, confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 22/06/15

Appendices

Appendix A (Biosis, 2014) Halladale and Speculant Project – MEG Pipeline. Flora and fauna Assessment

Appendix B (Ecology and Heritage Partners, 2015) – Halladale and Speculant Project, Targeted Fauna Survey

Appendix C (Biosis, 2011) Halladale and Blackwatch project – Flora and fauna assessment

Appendix D Ochre Imprints; Draft Cultural Heritage Management Plan 13060 (Schell 2015); Halladale, Blackwatch and Speculant Pipeline.