3.0 CONSTRUCTION

3.1 INTRODUCTION

This section details the construction works associated with the proposed facility and indicates the mitigation measures to be implemented to ensure that potential environmental impacts associated with construction are minimised.

The development of this site is likely to occur over an estimated 32 month period commencing in early 2010, during which time construction activities will have the potential to impact the existing environment. After the estimated 32 month construction period, it is expected that a fully operational power plant will be commissioned and capable of operating in all design modes. The specific details of the construction programme are not currently known as such this programme will be developed by the main contractor. It is therefore difficult to assess the staffing and delivery levels for the development. However it is considered that the design and proposed layout of the facility has developed sufficiently to discuss the potential environmental impacts of proposed construction methods. An estimate of construction traffic volumes has been made for a site of this size and typical works associated with a development of this type are described.

The timing of the commencement of construction is subject to planning, design, tendering and ecological constraints. It would be expected, that any works associated with site clearance and removal of woodland would be seasonally limited to mitigate against any adverse ecological affects. The impact of construction activities on Flora and Fauna and Roads and Traffic are assessed in Chapters 10 and 14, respectively. A construction management plan will be developed and implemented for the construction phase of the development. This document will provide a framework under which construction activities which have potential for environmental impact (e.g. generation of dust, ecological impacts, surface water discharge, etc) will be managed. Mitigation measures as outlined in the EIS will be included within this plan.

Table 3.1 Typical Construction Timeframe

Phase	Activity	Anticipated Duration
1	Site Evaluation	Up to 2 months
2	Site Preparation and Clearance	Up to 2 months
3	Civil and Structural Works	16 months
4	Mechanical and Electrical Installation	10 months
5	Commissioning and Testing	4 months

3.2 PLANT

Equipment to be used during the construction of the facility will be typical for a project of this scale. In general the following machinery will be used:

- Loader
- Scraper
- Mobile crane
- Backhoe
- Excavator
- Grader
- Roller
- Piling hammer
- Skid steer loader
- Vibratory compactor
- Haulage Vehicles
- Delivery and vehicles for concrete and materials.

Heavy vehicle movements to the site are expected to consist predominantly of plant and material deliveries. The majority of machinery associated with the construction phase is likely to remain onsite for the duration of the construction process. Therefore, the traffic associated with heavy plant will be limited to their delivery and removal, with the intervening period comprising internal movements within the site.

It has been estimated that during the course of an average day during construction, approximately 15 trucks will access the site to either deliver materials or remove waste. These will be spread over the course of the working day.

3.3 DURATION AND PHASING

3.3.1 Phase 1: Site Evaluation

Prior to commencement of construction, geotechnical investigations such as trial pits and C.B.R. tests will be conducted to verify foundation designs and road construction. All investigations required prior to enabling works shall be carried out in accordance with BS 5930 (Code of Practice for Site Investigations).

3.3.2 Phase 2 Site Preparation and Clearance

There are no areas of land to be acquired prior to construction, as the applicant is in possession of the entire area bounded by the red line as illustrated in Figure 2.7 and Planning Drawing Reference Number C007335-04. This phase of construction will not commence until the main construction contract is awarded and will initially comprise clearance of conifer woodland in north-west area of the site, fencing, excavation, re-grading and landscape berming and planting. The site clearance works will be undertaken in accordance with best practice. Removal of the conifer woodland patch in the north western area of the site will be undertaken outside the bird breeding season (1st March until the 31st July) to mitigate disturbance to birds. Mitigation measures to avoid and limit impact to flora and fauna include; implementation of an environmental management plan which will address water run off and noise and dust generation, implementation of a suitable landscaping strategy to compensate for habitat loss and to benefit the wildlife of the local area, retention of hedgerows and treelines along the boundary of the site, etc. Also site clearance will proceed only after cognisance is made to the ecological mitigation measures as detailed in Chapter 10, Flora and Fauna.

As the site is flat there will be limited requirement for *cut and fill* activity. The proposed finished floor level (FFL) of buildings on site will be constructed 500mm above the estimated 100 year flood level of the Silver River, 46.85mOD (Malin). This FFL was determined following completion of a flood assessment for the site, refer to Chapter 9, Hydrology. Where cutting or excavation is carried out, this material will then be reused, if possible, in areas of the site where fill is needed or in areas requiring landscaping. All existing concrete hardstanding materials will be crushed on site for re-use on site as sub-base or berm materials. If any additional material is required this will be imported into the site in a safe and controlled manner, so as to minimise the potential for nuisance and disturbance.

As the site is considered brownfield should any localised ground contamination be encountered it will be dealt with and removed off site by a specialist licensed contractor. Lumcloon are committed to ensuring that all the necessary mitigation measures are implemented. Haul roads, internal construction site roads, main drainage runs, temporary car-parking and staff facilities will also be constructed during this phase. Such site preparation works are expected to take approximately 2 months.

Site preparation works will also involve the site set up by the building contractor, which will include provision of the following items:

- Site Office
- Site Facilities (canteen, toilets etc.)
- Office for Resident Engineer
- Secure compound for the storage of all on site machinery and materials
- Carparking
- Permanent/temporary fencing
- Site Security.

Construction traffic will enter the site via the existing site access road. A site compound will be installed near the site entrance to facilitate staff parking and site offices. Traffic related issues are further discussed in Chapter 14.

3.3.3 Phase 3: Civil and Structural Works

This phase will comprise the construction of the buildings, bunds, roads completion, drainage and infrastructural works completion. It is anticipated that the power generation building will be constructed on piled foundations. The foundations will be designed to withstand vibrations from turbine operations. The power generation building will be steel frame with a combination of masonry and metal cladding chosen to conform to safety requirements and minimise visual and noise impact. It is anticipated that these works will be undertaken over an approximately 20 month period. Large items of plant /equipment will be installed during this phase.

3.3.4 Mechanical and Electrical Installation

Mechanical installation will include gas and steam turbines, heat recovery steam generators, air cooled condensers and associated pipework. These components will be delivered to the site by the preferred supplier and will be installed in accordance with manufacturer requirements. All pipeworks and ducting will be assembled on site. The electrical installation will include transformers, wiring and cabling from the generators to the switchyard.

3.3.5 Phase 4 Installations and Commissioning

This phase will comprise the installation and testing of mechanical and electrical equipment. It is anticipated that the duration for the installation and testing works will take approximately four months. During this phase final completion and finishing works will be carried out in anticipation of handover of the project to the client.

It should be noted that the above is indicative only and may be subject to variations on consent from the planning authority and also to final schedule agreement with the main contractor.

3.4 EMPLOYMENT

Employment levels across the project will vary depending on the construction programme and the extent of activities occurring on the site. It is expected that during peak activities, there will be up to 400 construction workers at the site. It is anticipated that during peak construction periods, approximately 200 vehicles will enter the site in the morning and leave the site in the evening. This is based on vehicle occupancy of two. An assessment of the likely traffic volumes which may arise during the construction and operational phase are discussed in Chapter 14, Roads and Traffic.

3.5 ACCOMODATION/FACILITIES

The relevant statutory requirements will be provided for all workers on the construction site including:

- Canteen facilities and drinking water supply
- Toilet, wash up and locker facilities and hot water
- Drying room
- Car parking for workforce
- First Aid Office
- Site Engineers & Resident Engineers offices
- Site offices for Contractors
- Secure site compounds.

3.6 CONSTRUCTION OPERATION HOURS

Subject to agreement with the planning authority, it is anticipated that the following times will constitute the standard working hours on the construction site.

- Monday to Friday 07:00 to 19:00
- Saturdays 08:00 to 16:00 pm
- Site closed on Sundays
- Site open on Bank Holidays as per Saturdays

Working hours may vary slightly depending on weather conditions and daylight hours during winter months. Heavy construction activities will be avoided where possible outside the normal working hours outlined above.

3.7 CONSTRUCTION TECHNIQUES

The construction techniques used will be standard and similar to those that would normally be associated with a large industrial project of this nature with both a building and technology installation element and a large civil engineering element.

3.8 MATERIALS

In so far as possible, construction materials will be from local sources to support the local economy and minimise environmental impact associated with vehicle emissions. All imported material that will be used on site will be retrieved from approved sources.

3.9 PIPING AND DRAINAGE WORKS

The construction of the foul and surface water systems will be an important element of the project. Temporary settlement ponds and interceptors will be constructed during the initial stages of the contract mitigating against adverse impacts on the existing drainage network.

3.10 EXTENSION OF INFRASTRUCTURE

Services such as ESB and Telecom will be brought to the dedicated construction compound from the nearest available point. Potable water for the development will be supplied from the existing group water scheme located at the front of the site. Temporary sanitary accommodation will be provided on site. All domestic effluent generated on site will be discharged to temporary sewage containment facilities prior to transport and treatment off site.

3.10.1 Waste Management

During the construction phase both solid and liquid waste will be produced at the facility. Waste oils, solvents and paints will be stored in a temporary bunded area prior to transport off site by a licensed contractor.

It is not envisaged that there will be any spoil materials arising from construction, as all the excavated soil will be re-used as part of the construction process. All other solid waste

generated during the construction phase will be adequately segregated and stored prior to transfer to an authorised facility for recovery/recycling/disposal.

3.11 FENCING AND SECURITY

Temporary fencing will be erected around the site compound. All on site machinery and materials will also be stored within the fenced compound.

3.12 NOISE, VIBRATION AND DUST

Dust emissions during the construction period have been detailed under temporary environmental protection measures. A construction management plan will be prepared and put in place for the construction of the development. This will include measures and trigger values to mitigate any potential impacts to nearby receptors. In addition noisy construction works will be limited to 8am to 6pm weekdays with Saturday working from 8am to 1pm. Baseline and proposed noise emission levels have been presented in Chapters 11, Air and Chapter 13, Noise of the EIS.

3.13 TEMPORARY ENVIRONMENTAL PROTECTION MEASURES

During the construction stage site construction roads will be sprayed with water during dry periods to mitigate against the formation of dry dust particles. Excavated materials stored or moved on site could lead to the formation of airborne dust particles during dry weather periods. Water suppressants will be used during these dry weather conditions.

The landscaping areas proposed for the facility will be constructed and planted at the earliest opportunity thus limiting the potential for off site migration of airborne dust. Where temporary stockpiles are required the material will be stored in designated areas and will be covered with tarpaulins and/ or regularly dampened during dry weather periods.

All potentially polluting substances such as oils, chemicals and paints used during construction will be stored in designated storage areas. These will be bunded to a volume of 110% capacity of the largest tank/container within the bunded area with all filling and draw-off points fully located within the bunded area. Drainage for the bunded area will be diverted for dedicated collection and safe disposal.

As stated above all domestic effluent generated on site will be discharged to temporary sewage containment facilities prior to transport and treatment off site.

Temporary settlement ponds and interceptors will be constructed as necessary during the early stages of construction mitigating against silt laden run-off to the existing drainage network.

3.14 POTENTIAL IMPACTS

Prior to commencement of development a construction quality assurance plan (CQA) will be jointly prepared by the contractor and developer. Written approval of the CQA will be sought from the planning authority prior to site development.

Good housekeeping and facility management during the construction period will ensure that there will be no negative environmental impacts from the construction of the proposed facility.

As stated previously in this section, the majority of machinery associated with the construction phase is likely to be onsite for extended periods of time. The traffic associated with these will therefore be limited to their delivery and removal, with the intervening period involving internal movements within the site. The impact of these on the surrounding road network is therefore expected to be minimal and infrequent.