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Environmental Constraints Analysis

Support of the Water Reconciliation Strategy for the Algoa Water Supply System

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DEPARTMENT OF WATER AND SANITATION

Directorates: National Water Resource Planning and Options Analysis

Support of the Water Reconciliation Strategy for the Algoa Water Supply System

ENVIRONMENTAL CONSTRAINTS ANALYSIS

Final: October 2017

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SUPPORT OF THE WATER RECONCILIATION STRATEGY FOR THE ALGOA WATER SUPPLY SYSTEM

APPROVAL

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Bold type indicates this Report.

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Executive Summary

Purpose of this Report

The purpose of this report is to provide a desktop overview and analysis of the environmental sensitivity of the five short-listed sites for a new balancing dam, highlighting potential issues and constraints and outlining the requisite environmental legal compliance requirements for each option. The report provides high-level input regarding the environmental issues/constraints and legal requirements of the five preferred options.

Environmental sensitivity and fatal flaws

From a terrestrial ecology perspective, the Upper Scheepersvlakte and Coerney sites are considered slightly more environmentally sensitive when compared to the Nooitgedagt sites, mostly due to an overlap with an Endangered Ecosystem. The vegetation cover associated with the Upper Scheepersvlakte and Coerney sites are also significantly more intact than that of the Nooitgedagt sites. The Coerney sites are further located along a well-defined riparian habitat which is usually associated with higher terrestrial biodiversity as well. No Red List species are known to occur at any of the sites.

From an aquatic ecology perspective the Nooitgedagt sites, being located within an Aquatic CBA2 catchment, are technically more sensitive in terms of land use impacts than the Upper Scheepersvlakte and Coerney sites. The CBA2 classification is however linked to the Sundays River estuary and the off-stream balancing dams will have no impact on water quality or quantity supplied to the estuary. There will also be no impoundment or restriction of movement of instream freshwater species. Given the aforementioned the, Coerney sites are in fact considered to have a greater aquatic sensitivity due to the drainage line within which they are located and thus the potential impact on a functional riparian habitat and sub-catchment hydrology. This is however not considered a fatal flaw or notable issue and is merely highlighting the fact that when comparing the proposed sites, the Coerney sites are ranked slightly higher in aquatic sensitivity than the other sites.

No fatal flaws were identified from a heritage and palaeontology as well as land use perspective.

From a purely environmental sensitivity perspective the Nooitgedagt sites are thus slightly preferred to the Upper Scheepersvlakte and Coerney sites. The aforementioned do however

not qualify as "fatal flaws", but merely something to take note of when evaluating the overall feasibility of the sites.

Legal compliance and requirements

All sites will require similar authorisations in terms of environmental legislation with the period to complete all applications and processes estimated to take between 300 and 350 days. Note that the water use licence application (WULA) and appeals regulations (GN R267 of 2017) has recently been promulgated, with the published timeframe for a WULA process adding to 300 cumulative days. Both the EIA process and WULA process timeframes also only refer to the regulated timeframes, i.e. once the application has been submitted and does thus not include report writing, undertaking of specialist studies and so forth. It is thus recommended that at least 18 months be allowed in total for environmental processes to be initiated and completed.

Other factors for consideration

The following is also worth mentioning when considering the feasibility and risks associated with each site.

Coerney sites' catchment and irrigation

The Coerney sites do have a small catchment of which a notable portion will be transformed to orchards in the near future. This means that the Coerney sites could be subject to irrigation return flows high in nutrients, herbicides and pesticides. Allowance for sufficient buffer distances should thus be considered in order to mitigate potential impacts on water quality.

Scheepersvlakte existing authorisation for smaller dam

Scheepersvlakte 98 Citrus Development Trust has applied for a smaller dam in the same location as the proposed Coerney sites. From an administrative point of view, the Scheepersvlakte 98 Citrus Development Trust will be required to withdraw or surrender the authorisation for the smaller dam in order for the larger dam's EIA to proceed. This will expose the Scheepersvlakte 98 Citrus Development Trust to a certain level of risk as they will lose the security of a smaller dam which has already been approved

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Abbreviations

ABLMC	Aquatic Biodiversity Land Management Class
AOO	Area of occupancy
DWS	Department of Water and Sanitation
CBA	Critical Biodiversity Area
DMR	Department of Mineral Resources
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECPHRA	Eastern Cape Provincial Heritage Resource Agency
EIA	Environmental Impact Assessment
GIS	Geographic information system
LSRWUA	Lower Sundays River Water User Association
M٤	Megalitre
MPRDA	Mineral and Petroleum Resources Development Act
NBA	National Biodiversity Assessment
NEM: AQA	National Environmental Management: Air Quality Act
NEM: BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act (No. 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NMBM	Nelson Mandela Bay Municipality
OFS	Orange-Fish-Sundays
ORP	Orange River Project
PES	Present Ecological State
SAHRA	South African Heritage Resources Agency
SEMA	Specific Environmental Managements Acts
STEP	Subtropical Thicket Ecosystem Project
WTW	Water Treatment Works
WULA	Water Use Licence Application

1 INTRODUCTION

1.1 Background

The Scheepersvlakte Balancing Dam, that forms part of the Orange-Fish-Sundays GWS with the irrigation canal system operated by the Lower Sundays River Water User Association (LSRWUA), was originally designed and sized only to operate as a balancing facility for the then Sundays River Irrigation Board (now the LSRWUA). When water requirements in the NMBM outstripped available resources in the early 1990's, it was decided to link the NMBM water supply to the OFS scheme. Due to emergency timelines, the dam was selected as the only suitable point of abstraction available for such an emergency supply. The gravity supply pipeline from the Scheepersvlakte Balancing Dam was sized for long-term flow requirements of both the Nelson Mandela Bay Municipality (NMBM) (280 Mł/day) and the right bank irrigators along its route to the Nooitgedagt WTW.

The NMBM, over the period 1993 to 2007, abstracted less than 70 Ml/day from the Scheepersvlakte Balancing Dam, but required an additional water supply to meet future requirements. Following recommendations made by the Algoa Water Reconciliation Strategy Steering Committee in 2009, the Department of Water and Sanitation (DWS) increased the NMBM water licence for abstraction from the Orange River Project in 2010 to 58.3 million m³/a (160 Ml/day).

Due to the age of the transfer infrastructure, the risk of failure has risen and additional balancing storage is urgently required and also to enable regular and proper maintenance of the canals to take place.

1.2 Brief Study Overview

Potential future water savings from the Orange-Fish-Sundays (OFS) system following the implementation of effective water use efficiency interventions is being investigated under Objective 2 of this study (Water Use Efficiency component) with a final *Water Reallocation and Potential Future Allocations* Report to follow. Recommendations for additional allocation to the NMBM will be made once the additional water that may become available from potential savings has been quantified. For the purposes of this report, and in line with initial indications of potential savings, an additional 18.2 million m³/a (50 Mt/day) has been assumed.

The purpose of the Identification of Options evaluation of the Feasibility Study, as part of the Support of the Water Reconciliation Strategy for the Algoa Water Supply System Study, is to

remove potential operating system constraints for sustainable delivery of bulk Orange River water to both the LSRWUA and the NMBM, for water requirements up to 2040. The objective is to limit risks of shortfall in supply as well as operational risks to acceptable levels.

1.3 Purpose of This Report

The purpose of this report is to provide a desktop overview and analysis of the environmental sensitivity of the short-listed sites for a new balancing dam, highlighting potential issues and constraints and outlining the requisite environmental legal compliance requirements for each option.

1.4 Assumptions and Limitations

1.4.1 Assumptions

The assessment is based on the following assumptions:

- It is assumed that the other options assessed are technically, legally or financially non feasible and that sufficient investigations have been undertaken to motivate the selection of the five sites as the preferred options for further assessment.
- The purpose of the assessment is to provide high-level input regarding the environmental issues/constraints and legal requirements of the preferred options.
- It has been assumed that any significant change in scope will be subject to the reassessment of the environmental issues/constraints and legal requirements.

1.4.2 Limitations

The following limitations are applicable to this assessment:

- This assessment does not replace any of the requisite investigations or studies required under the National Environmental Management Act (No. 107 of 1998) or any of its Specific Environmental Managements Acts (SEMAs) in order to obtain authorisation to proceed with the proposed project.
- The assessment was done on desktop level and minor anomalies might exist in terms of published data and an actual field assessment.
- The spatial datasets used vary in detail, accuracy and scale and while useful must be used and interpreted with the necessary level of caution.



• The environmental legal requirements are based on the current published legislation and are subject to review once the environmental impact assessment (EIA) and other authorisation processes formally commence.

2 ENVIRONMENTAL SENSITIVITY ANALYSIS

2.1 Aquatic Ecology

All dam options are off-stream balancing dams and do not directly impact on a significant watercourse (also refer to 2.3.1). The typical impacts associated with a large instream dam are thus not applicable, with the focus mostly on the catchments within which the sites fall.

2.1.1 Eastern Cape Biodiversity Conservation Plan (ECBCP)¹

The Upper Scheepersvlakte site and Coerney Sites do not fall within an Aquatic Critical Biodiversity Area (CBA) (Figure 2.1). The Nooitgedagt Site North overlaps two CBA2 subcatchments (quaternary catchment N40E) while the southern site falls only within the southern sub-catchment. Both sub-catchments are classified as A2b i.e. "free flowing rivers important for fish migration" and are linked to the Sundays River Estuary. In terms of the Aquatic Biodiversity Land Management Class (ABLMC), the sub-catchment transformation threshold is less than 15% of the total sub-catchment area.

2.1.2 National Freshwater Ecosystem Priority Areas (NFEPA)²

In terms of NFEPA Rivers (Figure 2.2), the Upper Scheepersvlakte and Coerney Sites are located approximately 3 km west from the Coerney River (Order 2, present ecological state (PES) Class C i.e. moderately modified) and 3 to 4 km north of the Sunday's River (Order 4, PES Class D i.e. largely modified).

The Nooitgedagt Site North is located approximately 500 m south of a minor tributary (Order 1, PES Class D i.e. largely modified). The non-perennial tributary drains east into the Sundays River (Order 4, PES Class D i.e. largely modified) which is approximately 250m to the east of the site. The Nooitgedagt Site South is located along a minor drainage line draining approximately 500m east towards the same section of the Sundays River as the northern site.

Also refer to Figure 2.2 indicating the dam sites' localities in terms of nearby NFEPA rivers. Neither of the sites fall within a sub-catchment classified as a "fish sanctuary", i.e. the

¹ Berliner D. & Desmet P. (2007) Eastern Cape Biodiversity Conservation Plan: Technical Report. Department of Water Affairs and Forestry Project No 2005- 012, Pretoria. 1 August 2007

² Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux, D.J., Driver, A., Hill, L., Van Deventer, H., Funke, N., Swartz, E.R., Smith-Adao, L.B., Mbona, N., Downsborough, L. and Nienaber, S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

catchments are not known to support or contain threatened and near-threatened freshwater fish populations.

Based on the NFEPA wetland GIS layer³, none of the sites impact directly on a wetland (also refer



³ The NFEPA wetland layer was derived from several datasets including the National Land Cover 2000, 1:50 000 inland water features from Chief Directorate Surveys and Mapping (DLA-CDSM 2006) and DWAF 2004 Farm Dams and rivers. It also contains several sub-national datasets for wetland delineation derived from other biodiversity planning initiatives. Although useful, the dataset contains significant gaps and inaccuracies and should not be used for anything more than high-level desktop screenings.

Figure 2.3 and Figure 2.4). The majority of "wetlands" in the vicinity (<500 m) of the sites are classified as artificial, i.e. mostly instream and off-stream farm/storage dams. There are a number of natural floodplain and valley bottom wetlands associated with the Sundays River immediately downstream of the Nooitgedagt sites. The aforementioned wetlands have PES scores of C (moderately modified) to Z1 (severely modified).

Note that the majority of sites (apart from the Nooitgedagt Site North) are located in minor drainage lines and that the absence of major wetland systems does not indicate a complete absence of minor seep or valley bottom wetland habitats within the sites. The level of this assessment is only sufficient to confirm that there are no wetland systems associated with the sites which could classified as a "fatal flaw" or high risk from an aquatic ecology/hydrology perspective.

Apart from the NFEPA wetland layer results, a valley bottom wetland approximately 1.2 km downstream (south) of the proposed Lower Coerney site has been noted on aerial imagery. The wetland forms part of a historical stream linking to the Coerney River and is likely to be impacted notably should the dam be constructed and natural runoff towards the wetland be intercepted. The wetland is approximately 9 ha in size. The wetland has a seemingly permanent nature with no notable seasonal fluctuation and a fairly dominant permanent zone⁴. The most likely cause of the wetland is return flows from applied irrigation, and should be further investigated during the EIA.

⁴ The permanent zone refers to the permanently wet zone of a wetland. The zone is dominated by obligate plant species including reeds (*Phragmites australis*), sedges and bulrushes (*Typha capensis*), or (2) floating or submerged aquatic plants. The soil is characterised by a predominantly grey matrix (i.e. fully leached) with few to no high chroma mottles (Department of Water Affairs and Forestry, 2005. *A practical field procedure for identification and delineation of wetlands and riparian areas*)



Figure 2.1: Proposed dam sites in terms of ECBCP sub-catchments



Figure 2.2: Proposed dam sites in terms NFEPA perennial and non-perennial rivers (with PES classification shown)



Figure 2.3: NFEPA wetlands in relation to the Upper Scheepersvlakte and Coerney Sites



Figure 2.4: NFEPA wetlands in relation to the Nooitgedagt Sites

2.2 Terrestrial Ecology

2.2.1 Eastern Cape Biodiversity Conservation Plan (2007)

The Upper Scheepersvlakte and Coerney sites falls within a terrestrial CBA2 area (Figure 2.5). Vegetation in the CBA is classified as T3, i.e. vulnerable vegetation types have been identified through the ECBCP systematic conservation assessment and 2003 Subtropical Thicket Ecosystem Project (STEP)⁵. It is also classified as a C1 ecological corridor (i.e. an ecological corridor identified in other studies and corridors mapped by experts).

The western portion of the Nooitgedagt Site North site also falls within a CBA2 with the same features as the Upper Scheepersvlakte and Coerney CBA2 with the exception that the CBA is classified as a C2 ecological corridor (i.e. an ecological corridor identified by the ECBCP using an integrated corridor design for the entire Eastern Cape Province). The eastern portion of the Nooitgedagt Site North and entire Nooitgedagt Site South falls in a CBA3, meaning that vulnerable vegetation types have been identified through the ECBCP systematic conservation assessment and STEP. There are however no other biodiversity features present in aforementioned CBA3 (according to the ECBCP data).

As both sites fall within areas indicated as "ecological corridors", the potential impact of the sites in terms of contributing to habitat fragmentation will have to be investigated further during the EIA. The sites falling within ecological corridors is however not considered a fatal flaw but merely something to keep in mind for mitigation and offset purposes during the EIA.

⁵ Pierce SM and Mader AD. 2006. The STEP Handbook. Integrating the natural environment into land use decisions at the municipal level: towards sustainable development. Centre for African Conservation Ecology (ACE). Report Number 47 (Second Edition). Nelson Mandela Metropolitan University, South Africa



Figure 2.5: Proposed sites in terms of the ECBCP terrestrial CBAs

2.2.2 National Biodiversity Assessment (NBA) (2011)⁶

i. Threatened Ecosystems and vegetation type

The Upper Scheepersvlakte and Coerney sites falls within an Endangered ecosystem associated with the AZa6 Albany Alluvial Vegetation type, which is classified as a riparian thicket subgroup (Figure 2.6). This vegetation type is mostly associated with the larger riparian habitats in the area, such as the Sundays, Coerney, Wit, Bezuidenhouts and Kariega rivers. The remaining natural extent of the ecosystem is around 47% with two known species of special concern. The Upper Scheepersvlakte and Coerney sites are bordered by a Least Threatened ecosystem associated with the AT6 Sundays Thicket vegetation type. Both Nooitgedagt sites also falls within the AT6 Sundays Thicket vegetation type.

ii. Protected areas

None of the sites fall within a protected area. All are however within a 10 km range from the Addo Elephant National Park, which is of relevance when considering relevant activities in terms of Listing Notice 3 of the 2014 EIA regulations (Government Notice R985, as amended).

2.2.3 Important Bird Areas⁷

None of the sites are within or within close proximity (>20 km) to an Important Bird area.

⁶ Driver A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L. & Maze, K. 2012. National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria

⁷ Marnewick MD, Retief EF, Theron NT, Wright DR, Anderson TA. 2015. Important Bird and Biodiversity Areas of South Africa



Figure 2.6: Proposed sites in terms of the NBA ecosystem classification

2.2.4 IUCN Red List⁸

i. Fish (Chordata) - Pseudobarbus afer

No information is available on recent population reductions in the study area and environs, except that available habitat is decreasing due to invasion by alien fishes. The area of occupancy (AOO) for *Pseudobarbus afer* is less than 10 km² and there may be fewer than 10 populations remaining, therefore this species qualifies as **Vulnerable**. There probably are three locations, namely the Baakens, Swartkops and Sundays rivers, but more information is needed about barriers within systems. Several populations still survive in the Sundays River system in tributaries draining the Suurberg Mountains. Not much is known of population trends, but it seems as if many of the streams in the Sundays River system have periods of severe drought during which the number of mature individuals may fluctuate and parasite loads increase severely in stagnant pools. They prefer clear to slightly discoloured mountain streams, especially pools in slow flowing reaches. Alien invasive fish species, especially *Micropterus* species have severely reduced the range of this taxon (Skelton 1993⁹). The impact of other alien fish species on this taxon is not well documented or understood.

The proposed dam sites will not impact on the habitat type described above (i.e. mountain streams, especially pools in slow flowing reaches) and any impact on *Pseudobarbus afer* populations is unlikely.

ii. Insects - Butterflies - Lycaenidae

There are seven known red list butterfly species occurring in the Eastern Cape province namely:

- Aloeides clarki
- Chrysoritis lyncurium
- Chrysoritis penningtoni
- Chrysoritis thysbe whitei
- Deloneura immaculata
- Durbaniella clarki belladonna:

⁸ IUCN 2017. *The IUCN Red List of Threatened Species. Version 2017-1.* <<u>http://www.iucnredlist.org</u>>. Downloaded on 12 May 2017

⁹ Skelton, P.H., 1993. A complete guide to the freshwater fishes of southern Africa.

• Lepidochrysops ketsi leucomacula

None of these occur in the study area. The study area also does not contain the habitat (vegetation, climate, altitude) associated with any of these species.

iii. Mammals

No Red List species are known to occur in the study area.

iv. Molluscs

No Red List species are known to occur in the study area.

v. Amphibians

No Red List species are known to occur in the study area.

vi. Avifauna

No Red List species are known to occur in the study area.

2.3 Other biophysical characteristics

2.3.1 Drainage and hydrology

The Upper Scheepersvlakte and Coerney sites fall within quaternary catchment N40D. The Coerney sites are situated within a minor drainage line with an approximate upstream catchment of between 35 and 45 km². The aforementioned drainage line was historically linked to the Coerney River with the current connection consisting of an excavated canal passing through orchards, i.e. none of the riparian habitat remains from where the drainage line exits the valley to where it enters the Coerney River. The relevant section of the Coerney River is classified as an Order 2 river with its upper catchment situated primarily in the Addo Elephant National Park. The Upper Scheepersvlakte Site is also located in a minor drainage with a very small catchment of approximately 4.5km². The drainage line historically discharged into the Coerney sites' drainage line/stream but is now completely impounded by the existing Scheepersvlakte balancing dam.

The Nooitgedagt sites fall within quaternary catchment N40E. The Nooitgedagt Site North does not form part of any specific drainage system, being located on a slight plateau above the Sundays River valley. As mentioned previously the northern boundary of the site is approximately 800m south of an unnamed stream which drains east into the Sundays River. The site does intersect several very minor drainage lines draining in a northern direction into aforementioned unnamed stream. The Nooitgedagt Site South is located within a minor



drainage line linked to the east facing slope of the Sundays River valley as the landscape transitions from the plateau to the valley. It's unsure what the catchment area of the Nooitgedagt Site South drainage line is as the plateau area has an undefined drainage pattern seemingly mostly draining in a south and south-westerly direction i.e. the Nooitgedagt Site South drainage line is unlikely to receive significant runoff or have well developed riparian habitat.

2.3.2 Surrounding land use/cover (<10 km radius)

The Upper Scheepersvlakte and Coerney sites consist of fairly intact natural vegetation (thicket). The surrounding land cover includes cultivated land to the east, south and west and transformed grazing areas to the north. It is understood that the entire area to the west and east of the Coerney sites is planned to be transformed to orchards (650 ha).

The Nooitgedagt sites consist of moderately degraded thicket and is currently being used for game farming. The aforementioned continues in a south and south-westerly direction. Land use to the north consists of the Nooitgedagt WTW and agricultural lands under irrigation. There are also several major (>132kV) overhead lines and an Eskom substation along the western edges of the proposed dam sites.

2.3.3 Heritage and palaeontology

All the sites are located on sedimentary strata (Figure 2.7 and Figure 2.8). The very rough scale SAHRA map indicates high paleo sensitivity for further investigation by a palaeontologist during the EIA¹⁰.

¹⁰ <u>http://www.sahra.org.za/sahris/map/palaeo</u> accessed 18/10/2017



Figure 2.7: Geology of the Upper Scheepersvlakte and Coerney sites (bright green)



Figure 2.8: Geology of the Nooitgedagt Sites (bright green)

2.4 Summary of environmental sensitivity

2.4.1 Terrestrial ecology

When comparing the sites, the Upper Scheepersvlakte and Coerney sites are considered slightly more environmentally sensitive than the Nooitgedagt Sites due to the vegetation cover being more intact and dense with a notable overlap on an endangered ecosystem (AZa 6 Albany Alluvial Vegetation type). The Coerney sites are further located along a drainage line with a defined riparian zone which is also likely to contribute to higher terrestrial diversity. The minor drainage line along the Upper Scheepersvlakte Site is unlikely to have any significant riparian habitat as can be seen from aerial imagery.

The Nooitgedagt sites on the other hand are notably overgrazed and transformed and while wildlife is likely to occur in the area as a result of active game farming i.e. animals being brought onto the fenced property, the sites do not have an inherently high terrestrial biodiversity. The Nooitgedagt Site South might be slightly more ecologically diverse than the northern site due to it occurring along a minor drainage line and valley slope (note not a ridge which is typically considered an ecologically sensitive area).

2.4.2 Aquatic ecology

None of the sites are considered sensitive from an aquatic ecology point of view, specifically in terms of the ECBCP and NFEPA. The Coerney sites are located within a minor watercourse historically linked to the Coerney River. The construction of a dam will thus lead to the destruction of a natural aquatic habitat (while creating a larger artificial one). The Upper Scheepersvlakte Site drainage line not considered to be of any aquatic or hydrological significance.

The Nooitgedagt sites, although being located within an Aquatic CBA2 catchment do not form part of any significant drainage system and will have no impact on the status or functions of the CBA. Although the Nooitgedagt South site is located it a minor drainage line the drainage line not considered to be of any aquatic or hydrological significance.

None of the sites are impacting directly on any wetland system of importance with only surface recharge to a valley bottom system below the Coerney sites being potentially affected.

2.4.3 Heritage and palaeontology

There are no known or obvious structures of heritage or cultural value that are registered on the SAHRA system or that could be picked up from aerial imagery. All the sites are located on mudstone and sandstone with a high likelihood of fossils occurring in some of the strata. The potential presence of fossils is however not considered a fatal flaw or negative impact but merely an indicator that a palaeontological study will be required during the EIA phase with the potential of on-site screening/monitoring for fossil finds during construction (bulk earth works only).

2.4.4 Surrounding land uses

The proposed sites are not in direct conflict with any of the surrounding land uses within a 10km radius of the sites. The only potential issue is the planned citrus development in the Coerney sites' catchment area with a dam planned in the same valley as the Coerney Sites. The Eskom infrastructure to the east of the Nooitgedagt sites should also be noted and allowed for in the design and construction planning should one of the two sites be chosen as the preferred site.

3 LEGAL REQUIREMENTS

The sections below briefly unpack the identified legal requirements under various environmental laws. Note that the sections below provide a high-level overview with the assumption that the specific legal requirements will be reviewed and confirmed once the project locality and scope has been finalised.

3.1 NEMA 2014 EIA Regulations (as amended)

The construction of the dam will require a Scoping Environmental Impact Report process as it will trigger a number of listed activities across Listing Notices 1, 2 and 3. The following specialist studies will be required as a minimum:

- Terrestrial ecology (habitat integrity, vegetation, fauna, avifauna)
- Aquatic ecology (habitat integrity, fauna, wetland identification and delineation)
- Phase1 Heritage and Palaeontological study

Additional specialist studies might be required based on the outcome of the public participation process and requirements of the relevant competent authority. Based on the desktop screening results, no other studies are however foreseen at this stage. The listed activities to be applied for should be determined once the project site and scope has been confirmed.

3.2 National Environmental Management: Waste Act (No. 59 of 2008, as amended)

The construction of the dams will result in a significant amount of spoil generated (with higher quantities expected for the Nooitgedagt Site North Site compared to the other sites. All the material might not be suitable for construction purposes or there might be an excess, which could lead to the material having to be disposed of somewhere.

This could potentially trigger Activity 9 of Category B of Government Notice R921 (2013, as amended) i.e. "the disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation". The need for a waste licence can however be circumvented by using the spoil material elsewhere for building or shaping purposes or using it to rehabilitate a mining area operating under a valid mining permit or licence.

Cognisance also need to be taken of Government Notice R634, 635 and 636 (2013) in terms of the handling, classification and disposal of waste during construction. In cases where Category C of Government Notice R921 is triggered during construction, cognisance has to be taken of Government Notice 926 (National Norms and Standards for the Storage of Waste, 2013).

It is recommended that the need for a Waste Licence and compliance with any other requirements and regulations under the National Environmental Management: Waste Act be reassessed once more details regarding the project are available. An application for a Waste Licence and associated EIA can be done as an Integrated EIA process together with other authorisations required under various SEMAs.

3.3 National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)

The Upper Scheepersvlakte and Coerney sites do fall within an endangered ecosystem as published in terms of section 52(1)(a) of the National Environmental Management: Biodiversity Act (NEM:BA). The aforementioned does however not require additional authorisation under NEM: BA with geographical areas of specific concern or sensitivity covered under Listing Notice 3 of the 2014 EIA Regulations.

Cognisance must also be taken of the Critically Endangered, Endangered, Vulnerable and Protected Species List (Government Notice R1187 of 2007, as amended) and Threatened or Protected Species Regulations (Government Notice R152 of 2007). In terms of taking ownership of the specific parcel of land, DWS should also take note of the Alien and Invasive Species Lists (Government Notice 864 of 2016) and Alien and Invasive Species Regulations (Government Notice R598 of 2014).

The need for a permit(s) under NEM: BA can only be determined after a suitably qualified specialist has completed a detailed field survey. The permit application process is however far less cumbersome than the EIA process and can be completed within 4 to 8 weeks.

3.4 National Environmental Management: Air Quality Act (No. 39 of 2004)

The operational phase of the project will understandably not trigger any thresholds under the National Environmental Management: Air Quality Act (NEM: AQA). Cognisance should however be taken of the National Dust Regulations (Government Notice R827 of 2013) during the construction phase as a significant amount of earthworks can be expected.

3.5 Mineral and Petroleum Resources Development Act (No. 28 of 2002, as amended)

The construction of the dam and specifically the dam wall and embankments will require a significant quantity of material. Should the material excavated for the dam basin prove to be unsuitable, material will have to be sourced elsewhere either from a commercial source or from a project-specific borrow pit/quarry. In the case of the latter, the applicant (currently considered to be DWS) will have to apply for a mining permit or licence which is subject to an EIA under Listing Notice 1 or 2 of the 2014 EIA Regulations¹¹. The aforementioned EIA cannot be done as part of an integrated EIA process, and the EA application and permit/licence application have to be submitted to the regional Department of Mineral Resources (DMR) offices (in this instance in Port Elizabeth).

The need for a mining permit/licence and associated EIA should be re-evaluated once geotechnical investigations have been completed and the suitability of *in situ* material for construction has been determined.

3.6 National Water Act (No. 36 of 1998, as amended)

The construction phase of the project will require a Section 21 (c) and (i) application for the Upper Scheepersvlakte, Coerney and Nooitgedagt Site South options as they is located within a watercourse. It is unlikely that the Nooitgedagt Site North site will require a Section 21 (c) and (i) application for the construction phase as it will not result in the impedance or diversion of flow in a watercourse or the alteration to beds and banks of a watercourse.

The operational phase of the project will require a Section 21 (b) application for the storage of water. The need for a Section 21 (a) application will be determined by the supply off-take point and will have to be confirmed once the site and scope has been finalised.

3.7 National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act (NHRA) protects archaeological and palaeontological sites, graves and burial grounds, places, buildings, structures and equipment of cultural significance, movable objects, including archaeological and palaeontological objects and material, meteorites and rare geological specimens, ethnographic art and objects, military

¹¹ Note that the March 2017 amendments to the 2014 EIA Regulations removed the need for an EIA as a direct result of a mining activity for entities qualifying under the Section 106 exemption in the MPRDA. The mining activities might however still trigger other listed activities e.g. removal of vegetation and is thus not completely exempt of an EIA process unless all associated activates can be kept below the thresholds specified in the EIA Regulations.

objects and so forth. Based on the extent of the proposed project, a Section 38(1) notification to the provincial heritage authority will be required as part of the EIA process. The provincial heritage authority (in this case the Eastern Cape Provincial Heritage Resource Agency (ECPHRA)) is required to respond within 14 days to a Section 31(1) notification, indicating whether or not a Phase 1 Heritage, Archaeological and Palaeontological assessment and report is required or not. ECPHRA is however seldom responsive to Section 38(1) notifications and the current practice is to proceed with a Phase 1 for any development exceeding the thresholds specified under Section 38(1).

Given the size of the proposed sites, the depth of excavation and the underlying geology with associated palaeontological sensitivity, a Phase 1 Heritage, Archaeological and Palaeontological field assessment will be required. The findings of the assessment will inform the need for permits and a findings procedure.

4 FINDINGS AND RECOMMENDATIONS

4.1 Environmental sensitivity and fatal flaws

From a terrestrial ecology perspective, the Upper Scheepersvlakte and Coerney sites are considered slightly more environmentally sensitive when compared to the Nooitgedagt sites, mostly due to an overlap with an Endangered Ecosystem. The vegetation cover associated with the Upper Scheepersvlakte and Coerney sites are also significantly more intact than that of the Nooitgedagt sites. The Coerney sites are further located along a well-defined riparian habitat which is usually associated with higher terrestrial biodiversity as well. No Red List species are known to occur at any of the sites.

From an aquatic ecology perspective the Nooitgedagt sites, being located within an Aquatic CBA2 catchment, are technically more sensitive in terms of land use impacts than the Upper Scheepersvlakte and Coerney sites. The CBA2 classification is however linked to the Sundays River estuary and the off-stream balancing dams will have no impact on water quality or quantity supplied to the estuary. There will also be no impoundment or restriction of movement of instream freshwater species. Given the aforementioned the, Coerney sites are in fact considered to have a greater aquatic sensitivity due to the drainage line within which they are located and thus the potential impact on a functional riparian habitat and sub-catchment hydrology. This is however not considered a fatal flaw or notable issue and is merely highlighting the fact that when comparing the proposed sites, the Coerney sites are ranked slightly higher in aquatic sensitivity than the other sites.

No fatal flaws were identified from a heritage and palaeontology as well as land use perspective.

From a purely environmental sensitivity perspective the Nooitgedagt sites are thus slightly preferred to the Upper Scheepersvlakte and Coerney sites. The aforementioned do however not qualify as "fatal flaws", but merely something to take note of when evaluating the overall feasibility of the sites.

4.2 Legal compliance and requirements

Both sites will require similar authorisations in terms of environmental legislation with the period to complete all applications and processes estimated to take between 300 and 350 days. The following specialist studies will be required as a minimum:

• Terrestrial ecology (habitat integrity, vegetation, fauna, avifauna)

- Aquatic ecology (habitat integrity, fauna, wetland identification and delineation)
- Phase1 Heritage and Palaeontological study

Additional specialist studies might be required based on the outcome of the public participation process and requirements of the relevant competent authority. Based on the desktop screening results, no other studies are however foreseen at this stage. The project might further require permits and/or authorisations in terms of the MPRDA, NWA, NEM:BA, NEM: WA and NHRA. These can be done concurrent with the EIA process as parallel or integrated processes. The need for the permits/authorisations can only be determined once the site and project scope has been finalised and depending on the findings of the specialist reports.

Note that the Water Use Licence Application (WULA) and Appeals Regulations (Government Notice R267 of 2017) has recently been promulgated, with the published timeframe for a WULA process adding to 300 cumulative days. Both the EIA process and WULA process timeframes also only refer to the regulated timeframes, i.e. starting once the application has been submitted and does thus not include report writing, undertaking of specialist studies and so forth. It is thus recommended that at least 18 months be allowed in total for environmental processes to be initiated and completed.

4.3 Other factors for consideration

The following is also worth mentioning when considering the feasibility and risks associated with each site.

4.3.1 Coerney sites' catchment and irrigation

The Coerney sites do have a small catchment of which a notable portion will be transformed to orchards in the near future. This means that the Coerney sites could be subject to irrigation return flows high in nutrients, herbicides and pesticides. Allowance for sufficient buffer distances should thus be considered in order to mitigate potential impacts on water quality.

4.3.2 Scheepersvlakte existing authorisation for smaller dam

Scheepersvlakte 98 Citrus Development Trust has applied for a smaller dam in the same location as the proposed Coerney sites. From an administrative point of view, the Scheepersvlakte 98 Citrus Development Trust will be required to withdraw or surrender the authorisation for the smaller dam in order for the larger dam's EIA to proceed. This will expose the Scheepersvlakte 98 Citrus Development Trust to a certain level of risk as they will lose the security of a smaller dam which has already been approved.

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