1 IINGXELO ZEENGCALI

1.1 Yembonakalo Yomphezulu Womhlaba (Appendix E2)

Olu phononongo lwengcali lweempembelelo zokusingqongileyo lunxulumene namandla eentshukumo zendunduma malunga nesikhululo samandla senyukliya (iNyukliya-1) esicetywa ukwakhiwa nguEskom. Kukho iziza ezithathu eziqwalaselweyo: iDuynefontein, iBantamsklip neThyspunt. Iifoto zasemoyeni ukusuka kowe-1942 ukuya kowama-2007 zihlalutyiwe ukuvavanya ukwakheka kweendunduma namandla entshukumo yemimandla yeendunduma ezishenxayo nemimandla yeendunduma ezinezityalo kwiziza zozithathu. Uncwadi olufumanekayo ngesifundo lufundiwe, kuquka neengxelo ezahlukeneyo ezilungiselelwe uEskom, yaye neentlobo ngeentlobo zeengcali zokusingqongileyo kubonisenwe nazo. Amatyelelo kwisiza enziwe, kuquka amatyelelo neengcali zemigxobhozo nezebhotani (nezenzululwazi ngezityalo).

EDuynefontein

Iindunduma zaseDuynefontein zenza inxalenye yepaseji yommandla wendunduma waseAtlantis. Iintlobontlobo zeendunduma ezifunenweyo ziindunduma ezinqamlezayo ezishenxayo, iindunduma ezinqamlezayo zizinziswe ngokuzenzela ngezityalo zamanye amazwe ezifana neRooikrans, nelinye icala elimbhoxo elinezityalo. Amanzi omhlaba “okukhanya kwasemini” eDuynefontein kuphela kwimigongxo yexeshana omnye okanye emibini, ngako oko azikho iimpembelelo ezibalulekileyo ezinxulumene nokusebenzisana phakathi kwamanzi omhlaba namandla entshukumo yeendunduma kwisiza.

Iindlela zokufikelela neentambo zothumelo zingakhiwa ngokunqamleza iindunduma ezishenxayo ngeempembelelo zokusebenza ezisuka kweziphakathi ukuya kweziphantsi. Iindlela zokufikelela neentambo zothumelo zingakhiwa ngokunqamleza imimandla yeendunduma ezinezityalo ezineempembelelo zokusebenza ezisuka kweziphantsi ukuya kwezingabalulekanga.

Umhlaba ongaphezulu nokugcinwa kwezinto ezingafunwayo ezikwindunduma eshenxayo uya kuba neempembelelo zokusebenza eziphakathi. Umhlaba ongaphezulu nokugcinwa kwezinto ezingafunwayo ezikwimimandla yeendunduma ezinezityalo uya kuba neempembelelo zokusebenza eziphantsi.

EDuynefontein, ama-25% ohlobo olukhethekileyo lweendunduma ezishenxayo aya kulahleka ukuba isiza seNPS ecetywayo siyasetyenziswa, yaye nangona kungathandeka ukungalahlekelwa zezi ndunduma ezishenxayo, esi ayisiso isiphene esibulalayo ngokwexabiso lokulondoloza imbonakalo yomphezulu womhlaba. Iindunduma ezinezityalo zokuzenzela azinalo ixabiso lolondolozo. Ulwalamano oluncinci lweendunduma ezinecala elifanayo elimbhoxo zeLate Holocene ziya kulahleka; oku kubalukeke ngokuphantsi ngokolondolozo.

EBantamsklip

Imimandla yeendunduma egqithisileyo/egabadeleyo yenzeka ecaleni konxweme kummandla waseBantamsklip. Iqulethe ikakhulu iindunduma ezinqamlezayo, ezo ikakhulu zizinziswe ngezityalo zamanye amazwe ezifana neRooikrans neentlobo ezithile zelizwe lasekhaya. Azikho iindunduma ezishenxayo ngoku kwisiza ngokwaso. Kukho iindunduma ezithile ezinemigca efanayo embhoxo ezindala kakhulu ezinezityalo ezajika

zalilityе ngexesha langaphambili kwelomkhenkce (kwiminyaka engama ~ 120 000 eyadlulayo). Amanzi omhlaba akenzi “ukukhanya kwasemini” kwisiza yaye azikho iimpembelelo ezinxulumene nokusebenzisana phakathi kwamanzi omhlaba namandla entshukumo yeendunduma esizeni.

Iindlela zokufikelela neentambo zothumelo zingakhiwa ngokunqamlezayo kwiindunduma ezenziweyo zezityalo ezineempembelelo zokusebenza eziphantsi. Iindlela zokufikelela neentambo zothumelo zingakhiwa ngokunqamlezayo kwiindunduma ezinemigca efanayo embhoxo zezityalo zendalo ezineempembelelo zokusebenza eziphantsi emva kokubuyiselwa kwisimo sangaphambili ngononophelo.

Umhlaba ongaphezulu nokugcinwa kwezinto ezingafunwayo ezibekeke phezu kwemimandla yeendunduma ezityalwe ngokuzenzela okanye iindunduma ezinemigca efanayo embhoxo yezityalo ezindala zendalo ziya kuba neempembelelo zokusebenza eziphantsi.

Ixabiso lolondolozo lomphezulu womhlaba wemimandla yeendunduma zesiza saseBantamsklip liphantsi, xa kucingwa ukuba eminye imizekelo yemimandla yeendunduma yohlobo lwazo ayikaze ibe neempembelelo.

EThyspunt

Iintlobo zeendunduma ezifunyanwa eThyspunt yimimandla yeendunduma zohlobo lommandla weendunduma odlula kumbindi womhlaba (ummandla weendunduma waseOyster Bay), kunye neendunduma ezifana necala elimbhoxo ezitsolo okwesipeliti (hairpin). Ngaphezu koko iindonga ezisemacaleni zemimandla yeendunduma ezishenxayo zangaphambili zidala amaqaqa amade eendunduma ezinezityalo. Iinxalenye zemimandla yeendunduma ezishenxayo zizinziswe ngokwenziwa ngezityalo zamanye amazwe ezifana neRooikrans. Imimandla yeendunduma ezishenxayo inamandla amakhulu entshukumo.

EThyspunt amanzi omhlaba “okukhanya kwasemini” kwiindawo ezininzi eziphakathi kweendunduma phakathi kommandla weendunduma waseOyster Bay adala amachibi phakathi kweendawo zeendunduma (ezaziwa kananjalo njengeendunduma ezehlelayo), apho imigxobhozo idla ngokufunyanwa khona. Ukuziphatha neempawu zokumpompoza kwamanzi omhlaba namanzi omphezulu ziphandiwe ukunceda ukuqinisekisa uzinzo lokuqhubeka, ngokuphathelele kumandla entshukumo endunduma, ukwakhiwa kweentambo zothumelo nendlela yokufikelela eThyspunt ukusuka emantla, ukunqamleza ummandla weendunduma waseOyster.

Amandla entshukumo yeendunduma ezishenxayo eThyspunt aphandwe ngokunzulu. Indlela yokufikelela, iintambo zothumelo nebhanti lokuhambisa lethutyana okanye indlela yokutsala/ukuthutha ingakhiwa ukunqamleza iindunduma ezishenxayo kummandla weendunduma waseOyster Bay eThyspunt. ***Umsebenzi owongezelelweyo wokuhlola amanzi omhlaba kumanzi omphandle nokumpompoza kwamanzi omhlaba angekho nzulu njengoko kufuneka, bekuqhutywa ngexesha lokubhala le ngxelo.***

Indlela yokufikelela ingakhiwa nokuba kusetyenziswa indlela egudileyo yamandla omoya ngentshukumo ephakanyiswe kancinci ngentla komphezulu ophakathi kweendunduma ezineekholveti ezibekeka rhoqo okanye ngebrorho yamandla omoya entshukumo ewela iindunduma ezishenxayo nemigxobhozo ephakathi kweendunduma ukuvumela

ukuthuthwa kwentlabathi ngaphantsi kwendlela ngaphandle kokudala ukuqokelelana kwentlabathi. Uyilo lwebrorho eyakheke ngamandla omoya wentshukumo lunokuba nempembelelo ephantsi yokusebenza.

Iintambo zothumelo zingakhiwa ukunqamleza ummandla weendunduma ezishenxayo waseOyster Bay. Iimpembelelo zokusebenza zamaphondo agqagqelene ngezithuba ezingama-300 ukuya kuma-400 m zingasuka kweziphakathi kwimeko yeendlela zokufikelela ezisetyenziselwa ukwakha, ukuya kwezisezantsi kwiimeko zeehelikopta ezisetyenziselwa ukwakha. Ukusebenzisa amaphondo agqagqelene ngezithuba ezingama-800 m, wonke ummandla weendunduma unganqamlezwa ngaphandle kwemisebenzi okanye izakhiwo eziphakathi kweendunduma ezishenxayo, ngako oko zingabikho kwaphela naziphi iimpembelelo.

Ibhanti lexeshana lokuhambisa okanye indlela yokuthutha ingakhiwa ukunqamleza ummandla weendunduma ezishenxayo ukunqamleza iOyster Bay ngenjongo yokuthwala izinto ezingafunwayo ukuya “kumhlaba omxinwa odibana nobanzi” kumantla esiza. Iimpembelelo zokusingqongileyo zinokuba phantsi emva kokuba ibhanti lokuhambisa okanye indlela yokuthutha isusiwe yaye ukubuyisela kwimo yangaphambili kugqityiwe. Nangona kunjalo, ukubuyisela kwimo yangaphambili kungacotha.

Iindlela zokufikelela, iintambo zothumelo nebhanti lokuhambisa lethutyana okanye indlela yokuthutha zingakhiwa ukuqamleza imimandla yeendunduma enezityalo ngeempembelelo zokusebenza eziphantsi. Ukufakela iziseko zebhanti lokuhambisa kusetyenziswa izibonda zomsekelo zedayamitha ephantsi endaweni yezisekelo zekonkriti, kuya kunciphisa iimpembelelo nangakumbi. Izomelezi zomhlaba okanye iibhloko ezinjalo kufuneka zisetyenziswe ukuzinzisa amacala okusikwa nokuzalisa amacala, njengoko ukubuyisela kwisimo ngokutyala izityalo emathambekeni kuya kuba nzima yaye kucothe.

Umhlaba ongaphezulu nokugcinwa kwezinto ezingafunwayo akunakho ukubekwa kwimimandla yeendunduma ezishenxayo zaseOyster Bay eThyspunt. Umhlaba ongaphezulu nokugcinwa kwezinto ezingafunwayo ungabekwa kwimimandla enezityalo eThyspunt ngeempembelelo zokusebenza eziphakathi.

Ixabiso lolondolozo lomphezulu womhlaba wemimandla yeendunduma ezidlula kumbindi womhlaba liphezulu eThyspunt, njengoko iyiyo kuphela imimandla yeendunduma emikhulu eshiyekileyo yolu hlobo esasebenzayo eMzantsi Afrika. Imimandla yeendunduma edlula kumbindi womhlaba waseCape St. Francis iyodwa ngokomlinganiso wengingqi, wenqila yaye mhlawumbi ngokwehlabathi. Ummandla wendunduma onezityalo ukhethekile, uphantse ube ngumzekelo wamandulo weseti efanayo yendunduma yamaqaqa eHolocene nePleistocene aneentlobontlobo zeemvelaphi: iindunduma ezinamacala afanayo ambhoxo, iindunduma ezinamacala afanayo ambhoxo atsolo, nemimandla yeendunduma ezishenxayo ezineendonga zamacala ezidlula kumbindi womhlaba, kuquka imizekelo eyodwa ngokukhethekileyo yeendonga zamacala ezinjalo. Ngokubanzi, imimandla yeendunduma yaseThyspunt inexabiso eliphezulu lokuchaza nokucacisa amandla entshukumo endunduma eziselunxwemeni.

Ukutshintsha kwemozulu

Iziphumo ezinokubakho zokutshintsha kwemozulu kumandla entshukumo yeendunduma zezi:

Ukurhoxa kommandla waselunxwemeni ngokusabela kumphakamo ophezulu wolwandle kungashenxisa okanye kudale amanxweme amatsha entlabathi adala iindunduma zentlabathi eziphetshulwa ngumoya. Iindunduma ezishenxayo nemimandla yeendunduma ngako oko ingadalwa kwimimandla enezityalo ngoku.

Ukuncipha kwemvula nokunyuka kwamaqondo obushushu eDuynefontein naseBantamsklip ziza kuxinzelela iindunduma ezinezityalo, ngako oku kuya kuba lula ukudaleka kokuphephuka kwentlabathi. EThyspunt, akulindelwanga ukuba ukuna kwemvula kutshintshe, kodwa amaqondo obushushu aya kunyuka, ngako oko kuya kuba lula ukudaleka kokuphephuka, kodwa hayi kakhulu njengakwezinye iziza.

Ukwanda kwesantya somoya akulindelwanga ukuba kube nayo nayiphi impembelelo ebalulekileyo kokusingqongileyo.

1.2 Yembonakalo Yokwakheka Komhlaba (Appendix E3)

Ngokubanzi impembelelo yesiKhululo saMandla seNyukliya kwimbonakalo yokwakheka komhlaba osingqongileyo incinci xa ithelekiswa nempembelelo enokubakho yembonakalo yokwakheka komhlaba osingqongileyo ***yesiKhululo saMandla seNyukli****ya* esicetywayo. Iinkqubo zophando zembonakalo yokwakheka komhlaba zikhokelwa ziiNuclear Regulatory Code, ngokukodwa iiU.S. Nuclear Regulation, ezithathwa njengesakhelo solawulo ***esiphambili*** sezizwe, kunye neenkqubo zophando zenzululwazi yokwakheka komhlaba ezikhokelwa kukwanda kwesigqibo kwimimandla yolawulo elandelelanayo yesi-1, 8, 40 nama- 320 km ukujikeleza isiza ngasinye esicetywayo.

Iimeko eziliqela ezahlukeneyo zembonakalo yokwakheka komhlaba ziyaqwalaselwa apha, eziquka:

- Intshukumo edalwa kwingingqi kukungcangcazelisa umhlaba (zii-injini zomsinga) kwisiza;
- Ukugqabhuka komphezulu;
- Ukuzinza komhlaba ongaphantsi komphezulu; kunye
- Nengozi yentaba-mlilo.

Idata (iinkcukacha) efumanekayo yembonakalo yokwakheka komhlaba kwiziza ezintathu iyaqwalaselwa ngokuphathelele kukufakela umatshini wamandla wenyukliya, eThyspunt, eBantamsklip naseDuynefontein, iphengululwe ngokuphathelele kwiimeko zengozi ezixeliweyo ngentla. Oku kubonise ukuba ingozi yembonakalo yokwakheka komhlaba malunga neemeko zengozi ezixeliweyo ngentla iphantsi kuzo zontathu iziza ezicetywayo. Nangona kunjalo, iinkqubo zophando ezongezelelweyo zeneotectonic kusafuneka zigqitywe yaye iziphumo zithunyelwe kwiNational Nuclear Regulator njengenxalenye yezingeniso zeNgxelo yoKhuseleko kwiSiza (Site Safety Report). Ezi nkqubo zophononongo, eziya kwenziwa ngokwahlukeneyo kwinkqubo yeEIA, zinokuba nempembelelo kwanalo utshintsho kwizigqibo ezifikelelweyo ukuza kuthi ga ngoku, yaye ngako oko azikho izigqibo zokugqibela ezinokwenziwa malunga nokufaneleka kwesiza.

Ngokwembonakalo yokwakheka komhlaba, azikho iindawo ezinovakalelo ekufuneka ziphetshwe kwiZiza zaseBantamsklip naseDuynefontein. Kwisiza saseThyspunt isiseko sezakhiwo ezibalulekileyo kufuneka singaweli ukudibana phakathi kweZakhiwo zaseGoudini naseSkurweberg.

Isigqibo sokungaqhubeki nesiKhululo saMandla seNyukliya asinakuba nempembelelo kwimbonakalo yokwakheka komhlaba kwiziza zaseThyspunt, eBantamsklip okanye eDuynefontein.

Ingozi encinci yokuzinza komhlaba ongaphantsi komphezulu ikhona kwisiza esicetywayo saseDuynefontein.

1.3 Umngcipheko Wenyikima (Appendix E4)

Jikekelele iimpembelelo zesiKhululo soMbane seNyukliya kokusingqongileyo kwe-geoscientific azibalulekanga xa kuthelekiswa neempembelelo zokusingqongileyo kwe-geoscientific ezinokuba khona kwisiKhululo soMbane weNyukliya esicetywayo. Amaphando egeo- scientific kwiisayithi zenyukliya akhokelwa ziiKhowudi zoLawulo lweNyukliya, ingakumbi iMimiselo yeNyukliya yaseMelika, ethathwa njengokuba iyeyona nkqubo-sikhokeo yolawulo olubanzi lwamazwe ngamazwe, kwaye ifuna amaphando ejoloji ne-geophysical ezigqibo ezinyukayo kwi- concentric regulatory radii yama- 320, 40 ne-8 km kokujikeleze isayithi nganye ecetywayo.

UCazululo lweeNgozi zeNyikima (Seismic Hazard Analysis) (SHA) luphathelene nokuqikela amanqanaba alindelekileyo okushukuma komhlaba kwisayithi ngexesha lokwakhiwa kwendawo ezakuba sisikhululo, ngokusekelwe kwimodeli yeenyikima kwingingqi nakummandla (ubukhulu kunye neendawo zenyikima). Lonke ucazululo lweengozi zenyikima lukwafuna izimvo ezibalulekileyo ngedata; imodeli yokwenzeka kweenyikima (imodeli *yomthombo* wenyikima) kunye nemodeli yengqikelelo yokushukuma komhlaba kwindawo ethile ngokweziphumo zomzekeliso ngamnye wenyikima (imodeli yokushukuma komhlaba). Umthombo weenyikima kunye neemodeli zokushukuma komhlaba zidityanisiwe, mhlawumbi ngokunokwenzeka okanye ngokumiselweyo, ukuze kufunyanwe iintshukumo zomhlaba emazithathelwe ingqalelo kuyilo. UCazululo lweeNgozi zeeNyikima ezinoKwenzeka (Probabilistic Seismic Hazard Analysis) (PSHA) lusebenzisa iindlela zocalulo manani eziqhubele phambili ezenza kuthathelwe ingqalelo ukungaqiniseki.

I-SHA ejongene nendawo ngqo yaye yaqaliswa kwezi sayithi zintathu liBhunga le-Geoscience (Council for Geoscience) (CGS), lisebenzisa indlela ekuthiwa yi-Parametric-Historic SHA. *Kusetyenziswa le ndlela, amaxabiso e-median PGA e-0.16 g, 0.23 g ne-0.30 g aye abalwa kwiisayithi eyase-Thyspunt, Bantamsklip neyase-Duynefontein, ngokwahlukahlukeneyo kwaye la maxabiso amisela amanqanaba eengozi zenyikima akhoyo ngoku kwezi sayithi.*

Ezi ziphumo zaye zamkelwa nguMlawuli weNyukliya weSizwe ((National Nuclear Regulator) (NNR). I- NNR nakuba kunjalo, yaye yawisa imiqathango yokuba isimo sangoku sobugcisa be-SHA kufuneka busetyenziswe ekuhlolweni kweesayithi xa kusenziwa izicelo ezisesikweni zemvume yokwakha nokusebenza. Ukuze kuhlangatyezwane nale mfuneko, i- Eskom igqibe ekubeni ilandele imimiselo yeKomishoni yoLawulo lweNyukliya eMelika (United States Nuclear Regulatory Commission) (okanye i- US NRC), ethathwa njengokuba yeyona ineseti yemimiselo

engqongqo, ecazululiweyo, ezanyiweyo kwaye yavavanywa ehlabathini, kwaye ke ngoko ichaza izenzo zamazwe ngamazwe ezigqwesileyo kwi-SHA kunye nenkqubo yemvume ecetywayo kwi-NNR. Ukongeza, iMelika, njengoMzantsi Afrika, lilizwe elililungu loMbutho wamaZwe ngamaZwe waMandla e-Atomikhi ((nternational Atomic Energy Association) (IAEA), ke ngoko ke umthetho wawo wesizwe uyangqinelana nemimiselo ye- IAEA.

ISahluko se-EIR sichaza imsebenzi eyenziweyo ukuza kuthi ga ngoku ngohlo lweengozi zenyikima kwiisayithi ezintathu, kwaye sinika imo yangoku ngokuphathele nokufaneleka kwazo ekubeni kwakhiwe izikhululo zombane wenyukliya kuzo.

1.4 I-Geotechnical Characterisation (Appendix E5)

I-Eskom Holdings Limited (Eskom) iceba ukwakha iziKhululo zoMbane zeNyukliya kunye nezakhiwo ezinxulumene nazo, mhlawumbi kwiphondo laseMpuma okanye eNtshona Koloni. Kuthathelwa ingqalelo iisayithi ezintathu:

- I-Thyspunt (eMpuma Koloni – kwiNtshona yeBhayi ngase-Oyster Bay)
- I-Bantamsklip (eNtshona Koloni – kwiikhilomitha ezi-5 kumzantsi mpuma we-Pearly Beach)
- I-Duynefontein (eNtshona Koloni – kufutshane neSikhululo soMbane sase-Koeberg, eKapa)

Indawo ekhethwayo yeesayirthi ezifanelekileyo iyakuchatshazelwa yinkqubo yoHlolo lweeMpembelelo lokusiNgqongileyo (Environmental Impact Assessment) (EIA), apho kuphandwa khona imiba emininzi ephathekayo, ye-biophysical, yeenzululwazi zaselwandle kunye neyobunjineli. Le ngxelo ithathela ingqalelo imiba ye-Geotechnical Engineering kwiisayithi.

Ingxelo isekelwe kumsebenzi owenziweyo wolwazi lwezembali ngokunjalo nokuqokelelwa kwedata okubanzi ngophando olunzulu kumamdla lo. Le mithombo yedata ichonge ezi mpawu zibalulekileyo zilandelayo ze-geotechnical kwiisayithi:

Isayithi yase-Thyspunt

- Iprofayile yomhlaba wesayithi yohluka kakhulu ngobukhulu xa uya ngasemhlabeni, uqala kwi-0 m ubukhulu (elwandle) ukuya phantse kuma-60 m ubukhulu kummandla wengquzu yentlabathi;
- Iipropati ze-geotechnical zale mihlaba ziyafana kwindawo yonke yesayithi kwaye ziyehla iindawo eziqinileyo ezenzekayo;
- Umaleko omanzi kwilitye ukhona kwisayithi, amanzi aphantsi komhlaba ekukhanyeni kwasemini elwandle kwaye kukho iyantlukwano kububanzi kumanzi aphantsi komhlaba kummandla weengquzu zentlabathi;
- Imihlaba awunako ukudibana kwaye xa umanzi, uyakufuna iindlela zokuzinziswa kwesilowupu kuko nakuphi na ukwembiwa kwemingxuma okucetywayo;
- Indibansiwelwano ezimbini zejoloji ziyenzeka phantsi kwemihlaba, zezi yi-Skurweberg ne-Goudini formations;
- I-Skurweberg Formation yakhiwe kufutshane nolwandle ize i-Goudini yona ibe semhlabeni;

- Amatye entlabathi e-quartzitic kwi-Skurweberg afaneleke kakhulu (aqinile kwaye axhathisa kakhulu kukhukuliseko) kukho amatye entlabathi aqulethe ikhabhoni e-Goudini Formation;
- Uxinzelelo lokhukuliso lwembali oluqulethe amasuntswana lukhona kwi-Goudini kwaye lo maleko wamaseuntswana uchaphazela icala aya kulo amanzi aphantsi komhlaba kwicala loMzantsi Mpuma.

Isayithi yase-Bantamsklip

- Iprofayile yomhlaba wesayithi iyohluka ingaphantsi kubukhulu kunesayithi yase-Thyspunt njengoko enye ingena emhlabeni, iqala kwi-0 m ubukhulu (elwandle) ukuya phantse kuma-20 m ubukhulu kummandla wengquzu zentlabathi;
- Iipropati ze-geotechnical zale mihlaba ziyafana kuyo yonke isayithi kwaye iindawo ezinkulu eziqinileyo ziyenzeka;
- Amanzi aphantsi komhlaba angaphezulu nje kwedwala
- Imihlaba ayinako ukudibana kwaye xa ifumile, iyakufuna iindlela zokuzinzisa islowupu kulo naluphi na umbiwo lwemingxuma olucetywayo, kodwa ke ubukho bomhlaba oqinileyo buyakunika uncedo ngokuphathele noku;
- Udwala lugcwele amatye entlabathi e-quartzitic e-Peninsula Formation;
- La matye entlabathi e-quartzitic adibene kakhulu, kwaye afanelekile kwaye emele ukufaneleka okukhulu kokuncitshiswa kwamaza e-Thyspunt;

Isayithi yase-Duynefontein

- Iprofayile yomhlaba wesayithi yohlukile kweyase-Thyspunt neyase-Bantamsklip ngokuba yona iphantse ibe luhlobo olunye lwama-20 m ubukhulu kuyo yonke idawo kwisayithi;
- Iipropati ze-geotechnical zale mihlaba ziyafana kuyo yonke isayithi;
- Amanzi aphantsi komhlaba aphakeme kule sayithi kwaye enzeka phakathi kwe-4 ne-10m ngaphantsi kwenqanaba lendalo lomhlaba;
- Imihlaba ayinakudibana kwaye xa ifumile, iyakufuna iindlela zozinzo kwislowupu, akukho nakuphi na ukwembiwa kwemingxuma okucetywayo;
- Iisanti ezingumthwalo omkhulu zikumatye ase-Malmesbury zine-greywacke, hornfels, mudstone, siltsone ne-shale, zonke zinokwahlukana ngokufaneleka kwazo;
- Ii-greywacke nee-hornfels zifaneleke kakhulu kune-mudstone, siltstone ne-shale, ezo ezonakala kakhulu.

Indlela yokungaSetyenziswa (No-go)

Ukuba ngaba kunokwenziwa isigqibo sokuba singakhiwa isikhululo sombane senyukliya akukho nanye kwezi mpembelelo zingasentla ezinxulunyaniswa nokwakhiwa kwesikhululo sombane senyukliya eyakwaziswa. Zonke iimpembelelo ezinxulumene naso ezimbi ziyakuthi ke zisuswe. Nakuba kunjalo, i-Eskom inokuzithengisa iziza zase-Thyspunt nase-Bantamsklip, kwaye xa kunokwenzeka neenxenye ezithile zesayithi yase-Duynefontein phantsi komzekeliso lo kwaye ke kunokuba khona ezinye iimpembelelo ezimbi ezingabonwanga kwangaphambili ezinokuvela kwimizekeliso yophuhliso lweepropati eyahlukileyo.

Iimpembelelo zokusingqongileyo ezinokutshintsha ukusebenza kokusingqongileyo kwendalo kwe-geotechnical environment zinxulumene:

- Nokungazinzi kwesilowuphu ematyeni nakwimihlaba ngaphambi kunye nasemva kokwakhiwa okukhokela kwimingcipheko yokhuseleko ebantwini kunye nakancinane nje kokusingqongileyo;
- Iimeko ze-Geotechnical (kwaye ingakumbi ubukhulu obugqithisileyo kunye neeprofayili zamanzi aphantsi komhlaba) okukhomba ukuba ukuphazamiseka okukhulu kweesayithi kuyakwenzeka kwimingxuma eyembiweyo (oku kuyakufuneka ukuba kulungiswe kubuyiselwe kwii-engile ezikuluhlu lwama-20º);
- Ukulahlwa kwezinto ezonakeleyo eziphuma kwimingxuma eyombiweyo.

Iimpembelelo ezinxulumene nozinzo kwislowupu zinokuba nemingcipheko kukhuseleko xa engekho amanyathelo okudanjiswa zinobukhulu obuphantsi kuzo zonke iisayithi, kuba iindlela zoyilo lozinzo kwisilowupu ziyakusetyenziswa ukuze kumelwane nale miba. Iindlela eziqhelekileyo zokuzinziswa kwesilowupu entlabathini ngokuqinisekileyo ziyakuthetha izilowupu ezembiwe imingxuma kuyakufuneka ukuba zilungiswe zibuyiselwe kwimo yangaphambili zibe zii-engile ezimcaba (zibuyiselwe kwii-engtile ezivuleke kancinane kuluhlu lwama-20º) ukunciphisa ukuba nokuba nentsilelo kwesilowuphi. Oku kukhokelela kwiimpembelelo ezingananzwayo (okukhokelela kwii-engile zesilowupi ezimcaba) zomthamo omkhulu wokufuneka kokwembiwa kwemingxuma, okukhokelela kuphazamiseko lweendawo ezinkulu ekwembiwa imingxuma kuzo kuney nemfuno yokulahlwa kwemithamo emikhulu yezinto ezonakeleyo. Iimpembelelo ezinxulunyaniswa noku ***(ngaphandle kokudanjiswa)*** zinobukhulu ***obuphakathi e-Duynefontein nase-Thyspunt zize zibe nobukhulu obusezantsi e- Bantamsklip. Xa zinokudanjiswa, oko okunemfuneko yokwemba imingxuma kufutshane nolwandle e-Bantamsklip nase-Thyspunt, ubukhulu beempembelelo ezinxulumene nazo zehliswe ziye phantsi kunye naphantsi-phakathi e- Duynefontein nase-Thyspunt ngokulandelelana. E-Bantamsklip, ubukhulu bezi mpembelelo buphantsi – busenza umthwalo ogqithisileyo omncinane kule sayithi.***

Iimaphu zobuntununtu besayithi ezibonisa ***ubukhulu bezi mpembelelo ezinxulumene nokwembiwa kwemingxuma*** zithiwe thaca kule ngxelo.

1.5 I-Hydrology (Appendix E6)

Le Ngxelo yeeMpembelelo zokusiNgqongileyo (Environmental Impact Report) (EIR) ithetha ngeempembelelo namanyathelo okudambisa ezinxulunyaniswa nokwakhiwa kunye nokusebenza kweSikhululo soMbane seNyukliya Nuclear Power Station (NPS) oqhelekileyo kunye nezakhiwo ezinxulumene naso kwisayithi enye eMpuma Koloni neesayithi ezimbini eNtshona Koloni. Iisayithi kuqala zaye zachongwa ngenxa yeziphumo zophando olwaqala ngoo-1980 kunye nakuPhononongo lweSikowupu se-EIA. Olu phononongo lweengcali luthetha nge-Hydrology kwaye lwaqhutywa yi-SRK Consulting.

I-Eskom iceba ukwakha i-NPS yobugcisa bohlobo lwe-Pressurised Water Reactor, enomthamo wama- ~4 000 MWe. Le NPS icetywayo iquka i-nuclear reactor, turbine complex, spent fuel, izibonelo zokugcina amafutha enyukliya, izibonelelo ezijongene nenkunkuma, idama lokungena nokuphuma kwamanzi kunye nesakhiwo seenkonzo ezahlukahlukeneyo eziza kuncedisa.

Zontathu ezi sayithi zicetywayo e-Thyspunt, Bantamsklip nase-Duynefontein zimi kunxweme.

Uphando sele luyenzile imiba yemimadla ngokusekelwe kwiindawo ezigcina amanzi ezinxulumene nemiba yonke kunye nommandla wophononongo wama-20 km ommandla. Ukusuka kuhlolo lommandla kwaye kwamiselwa ukuba akukho mithombo yamanzi okusela aphezu komhlaba afumanekayo kuyo nayiphi na kwezi sayithi. Eminye imithombo yamanzi okanye ukucocwa kwamanzi aselwandle ke ngoko kufuneka kuthathelwe ingqalelo. Ukususwa kwetyuwa kumanzi aselwandlle kuxoxiwe ngako kwingxelo yophononongo lwengcali yoNikezo lwaManzi aFreshi.

Ngepaseji emxinwa yendawo yesikhululo senyukliya esicetywayo ngoku kunye nezakhiwo ezinxulumene nayo zeesayithi kukho umngcipheko onokubakhona wokugcwala kwamanzi okumanqanaba asezantsi ngakunxweme lwepaseji emxinwa kwimeko yokuba kubekho amanqanaba aphezulu angaqhelekanga amanzi. Ingozi yokugcwala kwamanzi ngenxa yamachibi ikwakhona kuyo nganye kwezi sayithi kwisigaba sokwakha, ngenxa yemingxuma eyembiweyo evulekileyo ngenxa yeziseko zendawo yesikhululo.

Ukuba nokonyuka kwamanqanaba olwandle okungenxa yosondelelwano lomhlaba kuneempembelelo ezincinane kwi-NPS kwaye utshinstho lwemozulu nalo lukuba neziphumo ezincinane ***kwi-hydrology yamanzi aphezu komhlaba*** xa kuthathelwa ingqalelo ukungabikho kweendlela zamanzi ezingundoqo kwiisayithi.

Ngenxa yokuqina komphezulu womhlaba kwindawo yesikhululo kunye nemisebenzi encedisayo ukuhamba kwamanzi esiphango kunye neencopho kulindeleke ukuba zonyuke malunga namaxesha angama-25 ukuya kwangama-40 xa kuthelekiswa neemeko zaphambi kophuhliso. Zonke iimpembelelo, nakuba kunjalo, zinokuncitshiswa ngokuphunyezwa kwamanyathelo okudambisa.

Impawu ezingundoqo ezenza zahluke iimpembelelo kokusingqongileyo kwiisayithi ezintathu kakhulu zinxulumene nemvula, ubukho bemigxobhozo ngexesha elithile lonyaka kunye neendlela zamanzi ezingathathi unyaka wonke. E-Duynefontein iimpembelelo kwimigxobhozo ebakhona ngexesha elithile lonyaka zingaphantsi kuba imvula iphantsi apha xa kujongwa ezi sayithi zintathu. Imvula e-Bantamsklip iphezulu kunase-Duynefontein, kodwa ke akukho zimpawu zintununtunu kokusingqongileyo okanye nayiphi na imigxobhozo enobuntununu kwizinto eziphilayo nakwindawo eziphila kuyo. Iimpembelelo ezingqalileyo kuzo zontathu ezi sayithi *ziphantsi* ngobukhulu ziqala kwiziphumo *ezisezantsi.*

Ukuba ngaba akukho siKhululo soMbane seNyukliya (indlela yokungakhi) kuyo nayiphi na kwezi sayithi, i-Eskom iyakuthengisa iipropati eyase-Bantamsklip neyase-Thyspunt kunye k***wakhona*** nomhlaba ogqithisileyo ***e***-Duynefontein. Iisayithi ke ngoko zinokuphuhliselwa ezinye iinjongo kungabikho lulawulo lungqongqo kangako kunye nemimiselo olungafaniyo nolo lokuFakwa kweNyukliya. Oku kunokukhokelela ekuhambeni kwamanzi okonyukileyo okuvela kuphuhliso. Ukuba ngaba impembelelo azilawulwa kakuhle ke ngoko zinokuba neziphumo ezibi. Nakuba kunjalo, iimpembelelo kwisayithi yase-Duynefonetin zinokuba ntle.

Eyona ndlela iGqwesileyo yezenzo zoLawulo iyamkelwa ekuchongweni kwamanyathelo okudambisa amanyathelo ezakhiwo kunye nalawo ingasingawo awezakhiwo. Amanyathelo okudambsia ezakhiwo aquka:

- Iingqumba zomhlaba eziguqulayo;
- Iintlenga yomhlaba;
- Izakhiwo ezikhupha amandla; kunye
- Namadama agcina amanzi amdaka.

AManyathelo angasingawo awezakhiwo aquka:

- Iinkqubo zolondolozo ezilungiselela amanyathelo okutsalwa kwamanzi esiphango; kunye
- Nokuveliswa kweencwadana zamanyathelo olawulo lokusebenza.

Ngoko ke akukho zinto zinokubulala kuyo nayiphina kwezi sayithi ngokuphathelene neempembelelo zamanzi aphezu komhlaba.

Ulwazi olukhoyo kufuneka longezwe kule miba ilandelayo:

- Imo ecazululiweyo noyilo lommandla wesikhululo sombane kunye nemisebenzi encedisayo;
- Ukuba kwingqingqi kunye nendawo yokuhlala enokuba khona kwixa elizayo/uphuhliso lwezorhwebo; kunye
- Nokulinganiswa kobuninzi bomahluko wemvula ngenxa yotshintsho lwemozulu kwisayithi nganye.

1.6 UHlolo lweNzululwazi ephathelene nokwenzeka kuManzi aphantsi koMhlaba (Geohydrology) (Appendix E7)

Olu hlolo luthetha ngeempembelelo namanyathelo okunciphisa anxulunyaniswa nokwakhiwa kunye nokusebenza kweSikhululo saMandla seNyukliya (Nuclear Power Station) (NPS) oqhelekileyo kunye nezakhiwo ezinxulumene naso kwiziza ezithathu eMpuma (1) naseNtshona (2) Koloni. Iziza kuqala zaye zachongwa ngenxa yeziphumo zophando olwaqala ngoo-1980 kunye nakoluPhononongo lweSikowupu se-EIA. Olu phononongo lweengcali luthetha ngeNzululwazi ephathelene nokwenzeka kumanzi aphantsi komhlaba kwaye lwaqhutywa yi-SRK Consulting, ngoncedo lweZiko lwamaPhononongo aManzi aphantsi koMhlaba (Institute for Groundwater Studies) kwiYunivesiti yaseFreyistata kunye neYunivesiti yomNtla-Ntshona ngemodeli yamanani.

Olu phononongo lweempembelelo lunolwazi lwaphambi kokuqala kokwakhiwa kunye nohlolo lweempembelelo kwezi ziza zilandelayo:

1. E-Duynefontein;
2. E-Bantamsklip; nase
3. Thyspunt.

Uphononongo lunika uhlolo xa lulonke lweempembelelo zesibonelelo senyukliya kwi-aquifer hydrodynamics kunye nangokuphendululekileyo. UMsebenzi oChazwayo (Terms of Reference) kuHlolo lweeNzululwazi eziphathelene nokwenzeka kumanzi aphantsi

komhlaba lweengcali kukuphanda:

- Ubukho kunye nokwakhiwa komaleko omanzi kwilitye wommandla/wengingqi kunye nezinye iiyunithi ezibandakanyekayo zeeNzululwazi eziphathelene nokwenzeka kumanzi aphantsi komhlaba ezinxulumene neziza, umzekelo, umhlaba onyina ukuhamba kwamanzi avela phantsi komhlaba, ukuqhekeka, imida;
- Ingqwalaselo yamanzi aphantsi komhlaba kuqukwa ukwakheka kwe-hydraulic conductivity/transmissivity, amanqanaba amanzi aphantsi komhlaba kunye nokunyuka esehla kwawo, ukuhlolwa kwekhemistri yamanzi aphantsi komhlaba kunye noxhathiso lwesamente nomhlaba kuhlaselo yikhemikhali;
- Ukuba nokwenzeka kongcoliseko lwamanzi aphantsi komhlaba, ukhukuliseko ngamanzi aphantsi komhlaba kunye nokususwa kwemathiriyeli ngenxa yohlaselo ngamanzi aphantsi komhlaba;
- Iziphumo zokutsalwa kwamanzi aphantsi komhlaba kwimimandla ekufutshane ngokuhamba kwamanzi aphantsi komhlaba kwiziza;
- Imodeli yengqikelelo emilinganiselo mi-3 yeeNzululwazi eziphathelene nokwenzeka kumanzi aphantsi komhlaba ebonisa umaleko omanzi elityeni, amanqanaba amanzi aphantsi komhlaba, imida yomaleko omanzi elityeni, kunye namacala ekuya kuwo amanzi aphantsi komhlaba;
- Imodeli emilinganiselo mi-3 yokuhamba ngokwamanani ukuvuselela ukusabela okukhethekileyo kummandla, ingingqi neziza kwamanzi aphantsi komhlaba kwiimpembelelo zendalo okanye ezenziwe ngabantu, umzekelo, ixesha elithile lonyaka, ukususwa kwamanzi ngexa lokwakha, ukutsalwa kwimimandla yamaqula;
- Imodeli yothutho yesingcolisi ukuze ivuselele naziphi na izingcolisi ezenziwe kwiinkqubo zamanzi aphantsi komhlaba ekusebenzeni kwiziza; kunye
- Nohlolo lwemingcipheko yeempembelo zee-NPS kokusingqongileyo okwamkelayo.

Umsebenzi obanzi nocazululiweyo uye waqhutywa kuzo zontathu iziza njengenxenye yolu hlolo, kuqukwa i-hydrocensus, ii-geophysics ezikumphezulu, ukubhola, ukuvavanya ukumpompa, iimvavanyo ze-packer, uhlalutyo lwekhemikhali, ukuhamba ngobuninzi kunye nokulungiswa nokuhlolwa kwezothutho.

Iimpembelelo ezine ezinokuba khona zokusingqongileyo ezibandakanya amanzi aphantsi komhlaba ziye zachongwa, zezi:

- Ukuguga komaleko omanzi welitye wengingqi;
- Ukuncipha kwemigxobhozo/ii-phreatophytes/iindawo ezimanzi/imithombo;[1]
- Ungcoliseko lwamanzi aphantsi komhlaba; kunye
- Nongcoliseko lonxweme lungenelelo lwamanzi olwandle.

Iimpembelelo ezimbini ezinokuba khona zokusingqongileyo kwi-NPS ziye zachongwa, ezi zezi:

[1] Nceda uqaphele ukuba imisebenzi kunye neenkqubo zophononongo lwenzululwazi yokuhamba kwamanzi okukhokelela kwiimpembelelo kwimigxobhozo kuxoxiwe ngazo kule ngxelo, iimpembelelo kwimigxobhozo zihlolwe kuHlolo loNxulumano lweziNto eziPhilayo kuManzi aFreshi (iSihlomelo esohlukileyo kodwa esinxulumeneyo kwiNgxelo yeeMpembelelo zokusiNgqongileyo). Uhlolo lweempembelelo kwiNgxelo yokuNxululeme neziNto eziPhilayo kuManzi aFreshi isekelwe kwimithombo yeempembelelo ekuxoxwe ngazo kuhlolo lophononongo lwenzululwazi yokuhamba kwamanzi.

- Ukwehla kwezakhiwo; kunye
- Nokuzaliswa ngamanzi aphantsi komhlaba.

Iziza ezithathu zimi kwimo engqongileyo engaselunxwemeni kukho oko kuthiwa ziiPaseji ezimXinwa ze-EIA apho ii-NPS kunye nezakhiwo ezinxulumene nazo ziyakwakhiwa khona. Ke ngoko ke, kukho impawu ezingundoqo ezithile zeeNzululwazi eziphathelene nokwenzeka kumanzi aphantsi komhlaba ekunokwenzeka ukuba zilawule ukwenzeka kwamanzi aphantsi komhlaba kunye nokuphatheka kwezi ziza Ezi zezi:

- Kubonakala kungenakwenzeka ukuba kubekho nakuphi na ukusetyenziswa kwamanzi aphantsi komhlaba ahamba ngemijelo;
- Amanzi aphantsi komhlaba kwisiza aya kuba kufutshane/ekupheleni kwendlela ahamba ngayo;
- Kuya kuba khona icandelo lokuhamba kwamanzi aphantsi komhlaba aya ngakwindawo ekuhamba kuyo amanzi (phezulu);
- Amanqanaba amanzi aphantsi komhlaba ayakuba kufutshane nomphezulu womhlaba;
- Ilityе eliqinileyo linokuba nendawo emcaba emxinwa;
- Okusingqongileyo/i-downstream receptor esabelayo kulo naluphi na ungcoliseko iya kuba yindawo eselunxwemeni/ulwandle;
- Kusenokwenzeka ukuba kubekho iinkqubo zendawo emanzi elityeni ezimbini kwisiza, naphezulu kwamahlalutye kunye nendawo emanzi elityeni eqhekekileyo kumazantsi;
- Le maleko mibini imanzi ematyeni kusenokwenzeka ukuba ibe kunxulumano lwe-hydraulic kodwa inokohlulwa yindawo egugileyo kwilitye eliqinileyo mhlawumbi oko kube kumisela indawo ethintela ukuhamba kobuninzi bawo amanzi aphantsi komhlaba;
- Ukukhuphela elwandle kwengingqi kunokuchaphazela kuphela umaleko omanzi welitye ophezulu. Imaleko emanzi yelitye enzulu inokukhuphela ngokungapha amanzi emhlabeni, kunokwenzeka ukuba kube kwiikhilomitha ezininzi ukusuka kwisiza ngasinye;
- Umgangatho wamanzi aphantsi komhlaba unokulambatha ngenxa yendibaniselwano yobude bendlela bokuhamba kwawo, ixesha lokudibana neemathiriyeli yemaleko emanzi elityeni kunye nokuba kufutshane elwandle (ungenelo lwamanzi olwandle, iityuwa eziphetshethwa ngumoya);
- Amazinga okuhamba kwamanzi aphantsi komhlaba kusenokwenzeka ukuba acothe ngenxa yezithako ze-hydraulic;
- Kuya kuba khona umda ofanayo phakathi kwamazi aphantsi komhlaba ‘afreshi’ avela emhlabeni kunye namanzi aphantsi komhlaba anetyuwa kwindawo eselunxwemeni;
- Amanzi aphantsi komhlaba anokondla imigxobhozo kunye nemithombo/iindawo ezitsitsa amanzi eziselunxwemeni ezinokuxhasa indawo ekuhlala kuyo izinto eziphilayo kunye nemeko ezingqongileyo; kunye
- Nokuvuza kwe-radioactivity akuyi kuchaphazela ngqo abasebenzisi abasele bekhona bamanzi aphantsi komhlaba. Nakuba kunjalo, nakuphi na ukukhutshwa komoya kunokuthuthwa kuziswe emhlabeni yimimoya ekhoyo kwaye kungcolise amanzi phantsi komhlaba ngokuba afakwe ngaphantsi kumanzi emvula.

Ezi mpawu ziye zathathelwa ingqalelo kwindlela yokwenziwa kolu phononongo kwaye zadlala indima engundoqo kwintelekelo yeempembelelo zokusingqongileyo. Kwisiza

sase-Bantamsklip kuye kwamiselwa ukuba akukho maleko imanzi ematyeni kunokufikwa kuyo ikhoyo, nakuba imaleko emanzi ekunokufikwa kuyo e-Thyspunt ikhona (engundoqo nenganeno) zize e-Duynefontein (zibe nganeno kwaye ibe ngundoqo ngaphaya emhlabeni).

Ukuthelekelelwa kweempembelelo ezinokuba khona kokusingqongileyo kushwankathelwa ngale ndlela ilandelayo kwizigaba zokwakha kunye nezokusebenza:

- Ukugcwala ngamanzi aphantsi komhlaba: ***kuPhakathi*** kuzo zozithathu iziza xa kungekho ukuncitshiswa luze lube ***Phantsi*** xa kuncitshiswa;
- Ukuphela komaleko omanzi welitye wengingqi: ***uPhakathi*** e-Thyspunt uze ube ***Phantsi-Phakathi*** e-Bantamsklip nase-Duynefontein kungekho ukuncitshiswa ube ***Phantsi*** kuzo zozithathu iziza xa kuncitshiswsa;
- Ungcoliseko olungelulo olwe-radioactive: ***luPhakathi*** kuzo zozithathu iziza xa kungekho ukuncitshiswa luze lube ***Phantsi*** xa kuncitshiswa;
- Ukuthotywa kwezakhiwo: E-Duynefontein umlinganiselo wokudleka unokusuka komncinane ukuya komkhulu kunye nokunyuka okungephi. E-Bantamsklip umlinganiselo wokudleka unokusuka komncinane ukuya komkhulu kunye nokuxobuka okungephi. E-Thyspunt umlinganiselo opheleleyo usuka ekungadlekini usiya ekudlekeni kunye nokuxobuka;
- Ungcoliseko ngemathiriyeli ye-radioactive phantsi komsebenzi oqhelekileyo wesixhobo sombane (reactor): ***Phantsi-Phakathi*** kuzo zozithathu iziza xa kungekho ukuncitshiswa kwaye zibe ***Phantsi*** xa kuncitshiswa;
- Indlela yokungasetyenziswa: ***ziPhantsi*** iimpembelelo e-Bantamsklip kwaye ***ziPhezulu*** e-Thyspunt nase-Duynefontein xa zingancitshiswa, kwaye z***iPhantsi*** e-Bantamsklip zize zibe ***Phakathi*** e-Thyspunt nase-Duynefontein xa zincitshiswa.

Amazinga entelekelelo asezantsi kakhulu ngumsebenzi weziza ezakhiwe kwiindawo eziselunxwemeni apho amanzi aphantsi komhlaba akuso/akufutshane nesiphelo sendawo ahamba kuyo kunye ne-downstream receptors ezisezantsi kunye nokusetyenziswa kwamanyathelo okunciphisa azanyiweyo navavanyiweyo. Ubuthathaka besiza (kukhutshelwa ngaphandle imigxobhozo, ekuthethwa ngayo kwingxelo eyahlukileyo) buthelekelelwa ngale ndlela ilandelayo:

- I-Bantamsklip: Phantsi;
- I-Duynefontein: Phantsi ngaselunxwemeni busonyuka ngobuthathakangasemhlabeni; kunye
- I-Thyspunt: Kakhulu buPhakathi.

Amanyathelo okunciphisa ayimfuneko aquka la alandelayo:

- Umsebenzi oqhubayo wothungelwano lokuhlola oluyilwe ngokufanelekileyo lwamanzi aphantsi komhlaba lwamanqanaba amanzi kunye nomgangatho kuyo yonke imaleko yamanzi kwilitye/imigxobhozo;
- Ukusebenzisa izithinteli ezibiyileyo kuyo yonke imingxuma eyembiweyo uku a) nyina ukunaba kwamanzi ngexa lokwakha kunye b) nokugcina indonga zemingxuma eyembiweyo zizinzile kunye neemeko ezikhuselekileyo zokusebenza;
- Ukusetyenziswa kokukhutshelwa kwamanzi elwandle okwenziweyo ampontshwa esuswa kwimingxuma eyombiweyo ngexa lokukhutshwa kwamanzi ukugcina imigxobhozo/imithombo/iindawo ezimanzi kunye nee-phreatophytes;

- Ukwakhiwa kwemingxuma ye-NPS kwisiza sePaseji emxinwa ye-EIA ukuze kwehliswe ubukhulu beempembelelo ezichongiweyo, umzekelo, ukuphepha iindawo ezineziphene zokuba khona kwenyikima, iindawo eziqhekekileyo, imigxobhozo, kunye neendawo ezimanzi elunxwemeni (kwenza ukuba kusebenze amanyathelo olawulo lokunciphisa amanzi aphantsi komhlaba);
- Ukusetyenziswa kweziseko ezixhathisayo kukhukuliso, imibhobho nezixhobo apho izakhiwo ziyakwakhiwa ngaphantsi kwendawo ehamba amanzi;
- Ukwakheka okunokuba khona kwesikeyile kufuneka kuthathelwe ingqalelo kuyilo kunye nakulondolozo lwezakhiwo ezifanelekileyo kwisiza sase-Thyspunt;
- Ukuphuhliswa kweprotokoli yokulungisa/ukunciphisa phambi kokwakha ukuze amanyathelo anokuthathwa abhalwe phantsi kwaye alungele ukusebenza ngazo naziphi na izehlo zokungcoliseka kwisiza okanye iimpawu ezithelekelela amanqanaba okutsala agqithisiweyo ngexa lokwakha.

Ngokusekelwe kuhlolo lwe lweeNzululwazi eziphathelene nokwenzeka kumanzi aphantsi komhlaba oluthiwe thaca kule ngxelo yengcali, zozithathu iziza zamkelekile ngokokusingqongileyo, ngokwamanzi aphantsi komhlaba, ekuphuhlisweni kwe-NPS.

Inqanaba lethemba lwalo lonke ulwazi oluthiwe thaca kule ngxelo yeengcali liphezulu.

1.7 Unikezo Lwamanzi Afreshi (Appendix E8)

Le Ngxelo yeeMpembelelo zokusiNgqongileyo (Environmental Impact Report) (EIR) ithetha ngeempembelelo namanyathelo okudambisa ezinxulunyaniswa nokwakhiwa kunye nokusebenza kweSikhululo soMbane seNyukliya Nuclear Power Station (NPS) esiqhelekileyo kunye nezakhiwo ezinxulumene naso kwiisayithi ezintathu eMpuma (1) naseNtshona (2) Koloni. Iisayithi kuqala zaye zachongwa ngenxa yeziphumo zophando olwaqala ngoo-1980 kunye nakuPhononongo lweSikowupu se-EIA. Olu phononongo lweengcali luthetha ngoNikezo lwaManzi aFreshi kwaye lwaqhutywa yi-SRK Consulting.

Iimfuneko zamanzi ze-4 000 MWe NPS zezi zilandelayo:

- Iimfuneko eziqhelekileyo : 70 L/s
- Imisebenzi yokwakha : 104 L/s
- Ukwakhiwa kwesayithi : 23 L/s

Unikezo lwamanzi luyafuneka ngeenjongo zokusela nokwakha ngexa lokwakhwa kwe-NPS kunye nokusela, ukususwa kweeminerali, kunye neenjongo zokukhusela umlilo ngexa lemisebenzi ye-NPS.

I-EIR isekelwe kuphononongo olubhalwe phantsi kunye nophando ngesayithi olubandakanya oku kulandelayo:

- Iingxelo zeSebe leMicimbi yaManzi namaHlathi (Department of Water Affairs and Forestry) (DWAF) reports;
- Ukujongwa kwakhona kwengxelo ze-Atomic Energy Corporation/Eskom kwiisayithi ezintathu ukususkela ngoo-1980 noo-1990;
- Ukujongwa kwakhona komthetho obandakanyekayo;

- Uphando olucazululiweyo ngesayithi kule EIR, kuqukwa nobalo lwabasebenzisi/imithombo esele ikhona, ukubhola kunye nokuvavanywa komngxuma wesitsala manzi, uhlalutyo lweekhemikhali kwisampuli yamanzi;
- Ulwazi olunikwe ngoogunyaziwe beengingqi abohlukeneyo.

Iindlela zonikezo manzi kuzo zontathu iisayithi zingoku kulandelayo:

- Amanzi kamasipala okanye e-DWAF avela kwizikim esele zikhona zengingqi okanye zommandla, ingakumbi amanzi avela kumphezulu womhlaba /kumadama kodwa ke kusenokwenzeka ukuba anokuvela nakumanzi aphantsi komhlaba;
- Ukuphuhliswa kwmadama amatsha yi-Eskom okanye oogunyaziwe beengingqi;
- Ukuphuhliswa kwemithombo yamanzi aphantsi komhlaba; kunye
- Nokususwa kwetyuwa emanzini aselwandle (Indlela ekhethwa yi-Eskom).

Ezi ziphetho zilandelayo ziyathathwa kolu phononongo olweengcali:

Thyspunt

- Kuko ukusetyenziswa okukhulu kwamanzi aphantsi komhlaba kwimimandla ejikelezileyo;
- Kukho imithombo eselunxwemeni kwisayithi;
- Iidolophu ezijikelezileyo zinikwa amanzi avele kumadama ase-Churchill nase-Impofu kunye namanzi aphantsi komhlaba;
- Kukho isikowupu sophuhliso olungaphaya lwemithombo yamanzi engingqi aphantsi komhlaba ukuze asetyenziswe ekwakheni kwisayithi kunye nakummandla ojikelezileyo;
- Imithombo yamanzi engingqi nawommandla angaphezu komhlaba aphantsi koxinzelelo kwaye utsalo olongezelelekileyo lwamanzi e-NPS lunokwenza mandundu esi isimo;
- Eyona ndlela ingundoqo yamanzi aphezu komhlaba apho kukho khona iimpembelelo kwingingqi kunye nakummandla iya kuba kukuthatha amanzi kwiSikim somLambo i-Orange (Orange River Scheme);
- Amanzi aphezu komhlaba kunye nakancinane amanzi aphantsi komhlaba akubonakali ngathi anokuchaphazeleka kakubi lutshintsho lwemozulu; kwaye
- Ukususwa kwetyuwa kumanzi aselwandle yeyona ndlela inokwenzeka kunikezo lwamanzi oluqinisekileyo okuneempembelelo zokusingqongileyo ezincinane kwaye akunakuchatshazelwa kukutshintsha kwemozulu. Le ndlela iyakuba nezona mpembelelo zincinane kwaye yindlela ekhethwa yi-Eskom' yonikezo lwamanzi afreshi.

Bantamsklip

- Akukho maleko omanzi kwilitye onokusetyenziswa kulo mmandla;
- Imithombo yamanzi aphezu komhlaba yengingqi neyommandla isetyenziswa ngokupheleleyo;
- Iidolophu ezijikelezileyo zifumana amanzi aphezu komhlaba kwiDama lase-Kraaibosch Dam kunye namanzi aphantsi komhlaba kwimithombo kunye nakwimingxuma yezitsala manzi;

- Imithombo yamanzi aphezu komhlaba yengingqi neyommandla iphantsi koxinzelelo kway utsalo olongezelelekileyo lwamanzi e-NPS luyakusenza sibe mandundu esi simo;
- Eyona ndlela ikukuphela kwayo yokufumana amanzi aphezu komhlaba kukuthatha amanzi kwisikim se-Riviersonderend-Bree;
- Amanzi aphezu komhlaba kunye nakancinane amanzi aphantsi komhlaba akubonakali ngathi anokuchaphazeleka kakubi lutshintsho lwemozulu; kwaye
- Ukususwa kwetyuwa kumanzi aselwandle yeyona ndlela inokwenzeka kunikezo lwamanzi oluqinisekileyo okuneempembeleo zokusingqongileyo ezincinane kwaye akunakuchatshazelwa kukutshintsha kwemozulu. Le ndlela iyakuba nezona mpembelelo zincinane kwaye yindlela ekhethwa yi-Eskom' yonikezo lwamanzi afreshi.

Duynefontein

- Kukho ukusetyenziswa okukhulu kwamanzi aphantsi komhlaba kummandla ojikelezileyo;
- I-Aquarius Wellfield ngaphambili yayiphuhliselwe ukuba inike amanzi aphantsi komhlaba iSikhululo soMbane weNyukliya sase-Koeberg (Koeberg Nuclear Power Station) (KNPS) ayisetyenziswanga kutsha nje ngenxa yemiqobo yomgangatho wamanzi. Le wellfield ifuna ubuyiselo kwimo yangaphambili olubanzi kodwa ke inokunika amanani lawo afunekayo ekwakheni nenxenye yokusebenza;
- I-KNPS idityaniswe kwisikim sonikezo manzi sikamasipala;
- Amanzi ongezelelekileyo aphezu komhlaba avela kwimithombo yoomasipala esele ikhona ngeke aqinisekiswe;
- Amanzi aphezu komhlaba kunye nakancinane amanzi aphantsi komhlaba akubonakali ngathi anokuchaphazeleka kakubi lutshintsho lwemozulu; kwaye
- Ukususwa kwetyuwa kumanzi aselwandle yeyona ndlela inokwenzeka kunikezo lwamanzi oluqinisekileyo okuneempembeleo zokusingqongileyo ezincinane kwaye akunakuchatshazelwa kukutshintsha kwemozulu. Le ndlela iyakuba nezona mpembelelo zincinane kwaye yindlela ekhethwa yi-Eskom' yonikezo lwamanzi afreshi.

Indlela yokungaSetyenziswa (No go)

- Kwimeko yokuba isayithi ingaphuhliselwa ii-NPSs, i-Eskom iyakuthengisa iipropati eyase-Bantamsklip neyase-Thyspunt kwaye iinxenye ezingeyomfuneko zase-Duynefontein nazo zinokuthengiswa. Kulo mzekeliso impembeleo zibonwa zinobukhulu obuphantsi, iziphumo ezingathathi cala kwaye ezinobukhulu obuphantsi kwisayithi yase-Bantamsklip (akukho maleko umanzi welitye) kodwa ubunzima buphakathi, iziphumo ezibi kwaye ezibukhulu buphezulu kwiisayithi eyase-Thyspunt neyase-Duynefontein kuba imithombo yamanzi aphantsi komhlaba engingqi anokusetyenziswa kakubi ngabanini mhlaba babucala/abakhi. Awona manyathelo okudambisa angundoqo anokusebenza kulo mzekeliso iyakuba kukunyanzelwa okungqongqo kweemeko ezisebenzayo kuko nakuphi na ukuvunywa kokuphuhliswa kweesayithi kwexa elizayo.
- Kwenziwa isincomo sokuba ukususwa kwetyuwa kumanzi aselwandle kuphunyezwe kwisayithi ekhethiweyo yonikezo lwamanzi afreshi. Amanyathelo okudambisa angundoqo afunekayo kolu nikezo lwamanzi ngala:

- Amanzi anetyuwa akhutshwe njengesiveliso senkqubo yokukhutshwa kwetyuwa emanzini aselwandle kufuneka akhutshelwe kummandla wokusefa ngexa lesigaba sokwakha (ukuya kuma-156 L/s) ukulungiselela uxubo;
- Amanzi anetyuwa akhutshwa njengesiveliso sale nkqubo yokususwa kwetyuwa emanzini aselwandle kufuneka axutywe namanzi apholisayo akhutshwe yi-NPS ngexa lokusebenza;
- Ingcali yezinto eziphila elwandle kufuneka ihlole iindawo ekukhutshelwa kuzo ukuze ihlole iimpembeleo kwizinto eziphilayo zaselwandle.

1.8 Isishwankathelo soPhumezo soMmandla wesiKhukula wonyaka wesi-1 ukuya kwi-100 (Appendix E9)

Iingcali eziliqela ezisebenza kwiNyukliya-1 EIA zicelwe ukuba ziqikelele ummandla wesikhukula wonyaka we-1:100 ngenxa yesikhukula esivela elwandle. Oku kunxulumene nobubanzi bepaseji yaselunxwemeni nokubekeka kwethambeka elisisinyuko lenyukliya phakathi kwePaseji yoFakelo lweNukliya echaziweyo.

Ummandla wesikhukula wonyaka we-1:100 ngumdibaniso wemiphakamo yomphezulu edalwa ziinkqubo eziliqela zaselunxwemeni. Ngokukodwa imiphakamo ngenxa:

- Yokuzala nokurhoxa kolwande
- Yokunyuka komphakamo wolwandle (apho kufanelekileyo)
- Yokuza ngamandla kwesaqhwithi
- Yokufikelela kweliza

Inkqubo engamandla ibonwa ingowona mphakamo uphezulu ubalwayo wokufikelela kweliza. Njengoko ukufikelela kuxhomekeke ikakhulu kwithambeka lokwakheka konxweme, ukuphakama kweliza nobunzulu bamanzi, kuyafuneka ukuhlela inkcazelo yommandla ophantsi kophononongo ngamanani anikana izithuba rhoqo emifanekiso eqhelekileyo yaselunxwemeni.

Isimbuku somphakamo wesikhukula ibalwa ngokudibanisa ukuzala nokurhoxa kolwandle, ukuza ngamandla kwesaqhwithi nokufikelela kweliza zomnye nomnye wemifanekiso yaye emva koko zifakelwe kwimaphu yomphakamo yedijithali (yemivo) yenkcazo-mphandle wesiza. Ummandla wesikhukula wonyaka we-1:100 ngako kukunqumlana komphakamo obaliweyo womphezulu kunye nomphezulu wenkcazo-mphandle.

Ukwenzela ukubala ubukhulu bommandla wesikhukula wonyaka we-1:100 wama-2075 ifuthe lokutshintsha kwemozulu libalwa ngobunjani obunokubalwa bezifundo zophando elwandle nenkcazo-mphandle yengingqi.

Ummandla waselunxwemeni nawo uvelelwa lutshintsho ngokusekwe kukwanda komphakamo wolwandle. Ukhukuliseko luyenzeka ngokuqhubekayo kwimiphakamo ephezulu ukunyuka elunxwemeni. Unxweme, umfanekiso, kulindelwe ukuchazwa ngokuthe nkqo, isixa esilingana nokunyuka komphakamo wolwandle nokukhukuliseka ukuya ngaphakathi elizweni umgama onolwalamano nethambeka lonxweme lwengingqi.

Ukuze ubale ummandla waselunxwemeni wexesha elizayo, kuyafuneka ukusebenzisa iinguqu ezixeliweyo ngentla zommandla wonxweme kwinkcazo-mphandle phambi

kokufakela umphakamo owandisiweyo womphezulu obaliweyo kumphezulu olungisiweyo.

Imimandla yaselunxwemeni yonyaka we-1:100 yesiza ngasinye ibaliwe yomhla wangoku nowama-2075. Ezi zinokusetyenziswa zezinye iingcali ezisebenza kwipaseji yaselunxwemeni nokubekeka kwezinyuko zenyukliya phakathi kwePaseji yoFakelo lweNukliya echaziweyo.

1.9 UHlolo loMgangatho woMoya *(Appendix E10)

I-Eskom iceba ukwakha isikhululo samandla senyukliya eMzantsi Afrika esinamandla okuvelisa umthamo wokuya kutsho kuma-4 000 MWe. Kule EIA, iprojekthi yaziwa njengeNyukliya-1, equka uvavanyo lweziza ezithathu. Njengenkombiso yokuqala yeshedyuli, kuthathwe ngokuba ufikelelo lwesiza nokulungisa uluhlu lwezinto ezishiyanayo ngokunyuka zeNyukliya-1 lucetyelwa uJanuwari wama-2013, yaye luya kuqhubeka ithuba leenyanga ezi-6 ukuya kwezili-12. Ukwakhiwa kwesikhululo samandla senyukliya kuya kuthatha iminyaka esi-7 ukuya kweli-9.

Iziza ezicetyelwa ezi zikhululo zamandla ombane ziquka:

- I-Duynefontein (eNtshona Koloni) emi kufuphi neSikhululo saMandla oMbane sase-Koeberg esikhoyo, eKapa;
- I-Bantamsklip (eNtshona Koloni) emi kwi-10 leekhilomitha emzantsi-mpuma wase-Pearly Beach; kunye
- Ne-Thyspunt (eMpuma Koloni) emi kwintshona yaseBhayi yaye emalunga ne-15 leekhilomitha kwintshona yase-Cape St. Francis.

IsiGaba sesiKowupu sale nkqubo yoHlolo lweeMpembelelo zokusiNgqongileyo (Enviromental Impact Assessment) (EIA) senze isincomo sokuba iziza ezibini eMntla Koloni (i-Brazil ne-Schulpfontein) zingaqukwa kuphando olongezelelweyo ngexesha lesigaba se-EIA.

I-Eskom iceba ukusebenzisa ubuchwepheshe besiXhobo soKwenza aMandla ngaManzi (Pressurised Water Reactor) (PWR). Nakuba kunjalo, uyilo lokugqibela lomatshini womthengisi okhethekileyo akukenziwa isigqibo ngalo okwangoku. Olu hlolo ngako oko belusekwe kwisikhululo samandla ombane esenziweyo senyukliya, ngokukhutshwa kolwazi lwe-atmosferi olubonelele ngemvulophu yeentlobo ezahlukeneyo zokuyilwa kwesixhobo sombane (reactor). Kuzo zonke iimeko, iimpembelelo zeyona meko imbi zihloliwe. Uvavanyo ngako oko luquka ukukhupha i-radionuclide ngobona buninzi ukuphuma kwisikhululo samandla ombane senyukliya ngexesha lokusebenza ngokwesiqhelo ngethuba lobomi bonke baso kwakunye nokufanekisa ngoyilo olusekelwe kwingozi (design basis accident) (DBA[2]) ngokusekwe kwiintlobo ezahlukeneyo zobuchule bokuyila isixhobo sombane, ezithathelwa ingqalelo yi-Eskom.

[2] Ukuthintela ingozi isibonelelo senyukliya kufuneka siyilwe kwaye sakhiwe kungekho lahleko kwiinkqubo, izakhiwo, kunye namalungu ayimfuneko ukuqinisekisa impilo nokhuseleko loluntu. IiNgozi eziSekelwe kuYilo, ezinokuquka ukugqabhuka kwemibhobho, ukungasebenzi kwamalungu, njalo njalo kufuneka zilawulwe zizibonelelo zokhuseleko ngendlela yokuba iziphumo kokusingqongileyo zigcinwe zingaphantsi kwamaxabiso axeliweyo okuyila e-NNR, njengokuba ithamo elisebenzayo kumsebenzi okanye kumalungu oluntu libe ngaphantsi kwama-50 mSv.

I-AIRSHED PLANNING PROFESSIONALS (Pty) Ltd yaqeshwa yi-ARCUS GIBB (Pty) Ltd ukwenza uHlolo leeMpembelelo zoMgangatho woMoya neNzululwazi ngeMozulu ukwenzela ukwakha okucetywayo, ukusebenza nokuphelisa ugunyaziso lwesikhululo samandla senyukliya kunye nezakhiwo ezinxulumeneyo.

INDLELA YOKUSEBENZA

Injongo engundoqo yophononongo ibikukumisela iimpembelelo zokungcoliseka komoya ezinokuba khona ezinxulunyaniswa nokwakha, ukusebenza nokuphelisa ugunyaziso lwesikhululo samandla senyukliya esicetywayo kwimo esingqongileyo. Ukuphumeza oku, inyathelo lokuqala ibikukuseka imiqathango yesiseko yeziza ezithathu ezicetywayo ngemilinganiselo yenzululwazi yemozulu (meteorology) yengingqi. Inyathelo elilandelayo ibikukumisela lonke ukhutsho lomoya ekulindeleke ukuba lube khona ngexa lezigaba ezahlukeneyo. Ngexa kuthathwe inkathalo enkulu ukuqikelela izinto ezikhutshwayo ebezilindelwe ngexesha lesigaba sokwakha, kulindelwe ukuba izinto ezahlukileyo ezithile ezincinci zinokugqibela zikhona kwisicwangciso sokugqibela sokwakha. Impembelelo ngexesha lesigaba sokuphelisa ugunyaziso zihlolwe ngokobulunga kusetyenziswa umzekelo owandulelayo wesicwangciso sokurhoxisa uxwebhu. Ukusasazwa emoyeni ojikeleza i-atmesfere kwezinto ezikhutshwayo zazo zonke izingcolisi zomoya ezinokuba khona ngexesha lesigaba sokusebenza kuqukiwe kuhlolo. Ezi ziquka ii-non-radionuclide nezinto ezikhutshwayo ze-radioactive. Ingxinano yomoya namazinga okuyeka zifaniswe kusetyenziswa idata yenzululwazi yemozulu erekhodwe kwisiza[3] nokusuka kwezona zikhululo zikufutshane zenzululwazi yemozulu zeNkonzo yeMozulu yoMzantsi Afrika (South African Weather Services) (SAWS) ezinedatha yembali eyaneleyo. Ngokuphathelene nokukhutshwa emoyeni kwe-non-radioactive, izikhokelo zobulunga bomoya orhangqileyo zisetyenzisiwe ukuthelekisa ngokuchasene neengxinano eziqikelelweyo, ezisebenza ukubonelela ngokuhluza iingozi zempilo[4]. Iimpembelelo ze-radionuclide zihlolwe ngendlela efanayo neyezinto ze-non-radioactive, oko kukuthi uthelekiso “kumda wethamo”. Nangona kunjalo, imisebenzi eqikelelweyo ye-nuclide (“iingxinano”) namazinga ezinto ezilahlelwa kumphezulu ziguqulwe kuqala zaba lithamo elisebenzayo[5]. Uphononongo lujolise kuphela ekuphefumleleni ngaphakathi, ukutshona kwilifu nokusasazeka kwemitha kumphezulu wemihlaba. Indlela yokuginya (amanzi nokutya) kujongwana nayo kuphononongo lwengozi xa iyonke kwimpilo kusetyenziswa iziphumo zengxinano yomoya namazinga okuunyaniswe phambi kolingo okuthathwe kolu phononongo.

Ngeenjongo zolu vavanyo, ummandla wophononongo ongama-40 eekilomitha ngama-40 eehilomitha uchaziwe ukwenzela izibalo zengingqi zokusasazeka. Akukho mmandla

[3] Idatha ephathelene neenzululwazi ze-atmosfere kwisiza e-Thyspunt nase-Bantamsklip ifumaneke iinyanga ezimbalwa kuphela ekuqaleni kohlolo lweempembelelo. Kuqwalaselo olulandelayo lohlolo, ngaphezu konyaka idatha ephathelene nenzululwazi ze-atmosfere kwisiza yaye yafumaneka kwaye uthelekiso kwidatha ye-SAWS lwabonisa umahluko omncinane, ongakhange utshintshe iziphetho zohlolo.

[4] Idatha ephathelene neenzululwazi ze-atmosfere kwisiza e-Thyspunt nase-Bantamsklip ifumaneke iinyanga ezimbalwa kuphela ekuqaleni kohlolo lweempembelelo. Kuqwalaselo olulandelayo lohlolo, ngaphezu konyaka idatha ephathelene nenzululwazi ze-atmosfere kwisiza yaye yafumaneka kwaye uthelekiso kwidatha ye-SAWS lwabonisa umahluko omncinane, ongakhange utshintshe iziphetho zohlolo.

[5] Idatha ephathelene neenzululwazi ze-atmosfere kwisiza e-Thyspunt nase-Bantamsklip ifumaneke iinyanga ezimbalwa kuphela ekuqaleni kohlolo lweempembelelo. Kuqwalaselo olulandelayo lohlolo, ngaphezu konyaka idatha ephathelene nenzululwazi ze-atmosfere kwisiza yaye yafumaneka kwaye uthelekiso kwidatha ye-SAWS lwabonisa umahluko omncinane, ongakhange utshintshe iziphetho zohlolo.

wophononongo okhethekileyo ochaziweyo malunga nothutho lomgama omde njengoko ezi bezisekwe kwimigama ehanjwa ngokwenene zizingcolisi kwithuba leentsuku ezintathu.

IINGCINGA NEMIDA.

Ukusilela ukwazi umthengisi okhethekileyo wesikhululo samandla senyukliya kuthathwa mnjengeikhewu. Oku kubaluleke ngokukodwa ngokuphathelene nexesha lomthombo wokukhupha i-radionuclide. Nakuba kunjalo, ukuze ucacise ngezinto ezinokukhutshwa ze-radionuclide ukusuka kwisikhululo samandla senyukliya esicetywayo, amaxesha omthombo ukuvela kubathengisi ababini abahlolwayo aqukiwe kuhlolo. La maxesha omthombo abonelela ngemvulophu yokuyilwa kwesixhobo zombaneezahlukileyo. Ezi zinto zikhutshwayo ziquka zombini iimeko eziqhelekileyo neziphazamisekileyo. Uhlolo ke ngoko lwalusekelwe kwezona ziphumo zakudala ezivela kwaba bathengisi babini. Kufuneka kuqatshelwe ukuba ukuze kwaneliswe iimfuneko ze-NNR, isikhululo samandla senyukliya esicetywayo kufuneka sihlale phakathi kwamazinga ezinto ezikhutshwayo amisiweyo kwimvume.

Iziganeko zentlekele bezingeyiyo inxenye yesicwangciso sophononongo lovavanyo njengoko ezi ziganeko zingaphantsi kolawulo negunya le-NNR. I-NNR iya kuhlola imeko yokhuseleko yesikhululo samandla senyukliya esicetywayo ukuqinisekisa ukuthobela iimfuneko eziqulethwe kwiSaziso sikaRhulumente R388 somhla wama-28 ku-Epreli 2006, “iMigangatho yoKhuseleko neZenzo zoLawulo”. Inkqubo ye-NNR ayikaqali okwangoku, kodwa iya kulandela emva kokuba umthengisi okhethekileyo we-PWR ekhethwe njengenxenye yenkqubo yokuthenga. Yiloo nto imizekeliso yengozi kungasetyenzwanga ngayo kolu hlolo.

Nangona ixesha lonyaka omnye elifutshane ngokuthelekiswa lokurekhoda idata yenzululwazi yemozulu e-Thyspunt nase-Bantamsklip, nalo kananjalo linokuthathwa njengokusilela ekusasazeni iziphumo zomzekelo, uthelekiso lwedatha kwisiza neerekhodi zexesha elide zase-Cape St. Francis nase-Hermanus, ngokulandelelana, lubonisa ukuba ubunjani bezinto ezinokubalwa ezikhoyo zenzululwazi yemozulu (oko kukuthi isantya somoya, amacala osinga kuwo umoya, ukuna kwemvula namaqondo obushushu omoya) zinokuthelekiswa yaye zibe neziphumo zezigqibo ezifanayo. Nangona uhlolo olongezelelweyo kwisiza lunokubonelelaa ngezilungiso ezincinci kwiziphumo, akulindelwanga ukuba izigqibo, ezinikiwe ngezantsi, zingatshintsha nangakuphi ukubaluleka.

Izicwangciso zokuphelisa ugunyaziso lwee-PWR ziyafana yaye ngako oko isicwangciso sokuphelisa ugunyaziso sase-Koeberg sisetyenzisiwe kolu hlolo. Ngaphaya koko, impembelelo kungafuneka zithobele imida yethamo elibalulwe nguMlawuli weNyukliya weSizwe (National Nuclear Regulator).

Ngexa uphononongo luquke isiseko sokuhlola ubulunga bomoya bee-non-radionuclide, uphononongo lwaphambi kokuqalisa lotshiso ngemitha aluqukwanga. I-NNR ifuna ukuba iphulo lokuhlola isiseko see-radionuclide liqhutywe phambi kokwakha. Ngaphezu koko, imida yethamo ebalulwe yi-NNR isebenza kwithamo elongezelekayo elibalelwe isikhululo samandla senyukliya esicetywayo. Iziphetho ngako oko azinakutshintsha, naxa umsebenzi we-radioactivity wendalo usekiwe kwiziza ezithathu.

Olu vavanyo lusebenzise imida yobulunga bomoya enikwe liSebe leMicimbi yokusiNgqongileyo (Department of Enviromental Affairs) (DEA) ukwenzela izinto ezikhutshwayo ze-non-radionuclide nayi-NNR ukwenzela izinto ezikhutshwayo ze-radionuclide, ngokulandelelana. Uhlolo lweengozi kwimpilo ke ngoko luthathelwa ingqalelo kwinqanaba lokuhluza. Iziphumo ezivela kolu vavanyo ziya kusetyenziswa njengegalelo kuVavanyo lweNgozi eMpilweni ukwenzela le EIA eya kuba luvavanyo lobulunga lwempembelelo yee-radionuclide empilweni yoluntu nakwizinto eziphilayo namakhaya azo endalo.

Nangona uhlalutyo oluqukayo lobuthathaka lomzekelo wokusasazeka belungagqitywanga, ezona mbonakalo zibalulekileyo zihloliwe, eziquka ukujongana nentsebenziswano yomhlaba nolwandle kunye nenkcazo-mphandle. Kuzo zonke iimeko, olona khetho lwakudala lukhethiwe ukugqibezela uhlolo. Uhlolo olubanzi olucazululiweyo lobulunga bedatha nemodeli yobuthathaka iya kuba yinxenye yesicelo semveme kwi-NNR.

IZIPHETHO

Iimpembelelo eziqikelelwayo ziya kufana kuzo zozithathu iziza. Ngaphezu koko, ngokusekwe kwiimpembelelo eziqikelelweyo zombini i-non-radioactive ne-radionuclide zongcoliseko lomoya, uvavanyo lugqiba kwelokuba akukho nasinye isiza ekufuneka silahlwe ngokuphathelene nesikhululo samandla senyukliya esicetywayo.

Uncitshiso olukhethekileyo luyakhuthazwa ngexesha lesigaba sokwakha kuphela. Ngenxa yoqikelelo lwempembelelo ephantsi yezinto ezikhutshwa yi-radionuclide phantsi kweemeko eziqhelekileyo zokusebenza, akukho nciphiso longezelelweyo luya kufuneka ngokuphathene nezinto ezikhutshwa yi-radionuclide.

IsiGaba soKwakha

Imithombo yeempembelelo ngexesha lokwakha inokuba kukukhutshwa kothuli oludlulayo oluvela kwimisebenzi yakwakha ngokubanzi (ukucoca, ukomba, ukukrwela, imiphezulu yomhlaba, njl) nezinto ezikhutshwayo eziphuma kwizithuthi nezixhobo zokusebenza. Iimpembelelo zesigaba sokwakha ziya kuba *nokubaluleka* OKUPHEZULU ukuba awekho okanye anyiniwe amanyathelo okunciphisa asetyenziswayo. Ezi mpembelelo zingancitshiswa ziye kwezi *kwezibaluleke* NGOKUPHANTSI ukuba iindlela ezingagangathwanga zigalelwa isamente (oko kukuthi zifakwe itela) kunye nokuphunyezwa kwesicwangciso solawulo lobulunga bomoya.

IsiGaba sokuSebenza

Imithombo enokubakho yezinto ezikhutshwa emoyeni ze-non-radioactive ngexesha lesigaba sokusebenza ziquka:

- Ikhabhoni, isalfure nee-nitrogen oxide kwimibhobho yeegesi evela kwii-injini zeejenereyitha zokuvelisa umbane wokuxhasa njengelalela;
- I-Formaldehyde ne-carbon monoxide ekhutshwa kukugqunywa ngerabha xa izinto zibuyela emsebenzini emva kokulungiswa; kunye
- Ne-Ammonia ephuma xa ubushushu bunyuka kwiijenereyitha zomphunga ngexesha lokuqalisa.

Iimpembelelo eziqikelelweyo zezi zingcolisi ze-non-radiological beziqikelelwe ziphantsi kakhulu xa zithelekiswa nemilinganiso yeempembelelo zengozi kwimpilo yomntu kunye neezityalo.

Ngexesha lokusebenza okuqhelekileyo, ubuninzi beentwana zemathiriyeli ye-radiological ziya kukhutshelwa kokusingqongileyo. Kungahoywa indlela yokutya, ithamo elisebenzayo eliqikelelweyo ukususka kwezi ndlela libonisa *ukubaluleka* OKUPHANTSI. Le ntelekelelo isebenza kuzo zozithathu iziza.

Iimpembelelo eziqikelelwayo zezinto ezikhutshwayo ze-radioactive ngexesha lesigaba sokusebenza e-Bantamsklip nase-Thyspunt ziboniswe *zinokubaluleka* OKUPHANTSI. Okwangoku, azikho izinto eziphuhliswayo zeshishini, zorhwebo okanye ezibalulekileyo zeendawo zokuhlala kule mimandla mibini. Oku kuqinisekiswe liphulo leenyanga ezintathu lokuthatha iisampuli ngelo xesha kulinganiswa imiphakamo yemidibaniso emoyeni ye-sulfure dioxide ne-nitrogen dioxide. Iimpembelelo zokungcoliseka komoya okongezelekayo ngako oko kunokuba ngokuyimfuneko koko kuphela okwesikhululo samandla senyukliya esicetywayo.

Ngokuchaseneyo, i-Duynefontein imi kummandla apho kunokubakho amazinga ongcoliseko lomoya aphakame kancinci ngenxa yokuba kufuphi naseKapa. Nakuba kunjalo, ngokusekwe kwimilinganiselo yangasemva, iimpembelelo zeminye imithombo yongcoliseko lomoya[6] kwingingqi ye-Duynefontein iboniswe ukuba inomda. Iimpembelelo eziqikelelweyo ezongezelekayo zongcoliseko lomoya kwisiza sase-Duynefontein zithathwa ngokuba *zibaluleke* NGOKUPHANTSI.

Usasazo lwezifaniso luquke inani lee-DBA ezichongiweyo. Elona thamo liphezulu lomzimba wonke ngesantya sokwehla komoya umgama we-1 km ukususka kwisikhululo samandla senyukliya ukulandela izaziso zebhaqo ezinjalo liboniswe lingaphantsi kowona mda uphezulu wamkelekileyo wama-50 mSv ngokuphathelene nesiganeko esinye, njengoko kuxeliwe yi-NNR.

IsiGaba sokuRhoxisa

Ukuba sesichengeni sokusasazeka kwemitha, ngokusekwe kwisicwangciso sokurhoxisa esiphuhliselwe i-Koeberg, kufuneka kugcinwe kuphantsi ngeyona ndlela yaye kungaphantsi kwethamo elifunekayo elixelwe nguMlawuli weNyukliya weSizwe (National Nuclear Regulator) (NNR). Njengoko le mida yethamo isekwe kumazinga akhuselekileyo okuba sesichengeni, kulindelwe ukuthi ukuba sesichengeni kusasazo lwemitha ngexesha lokugunyazisa kuya kuba phantsi. Isicwangciso sinezigaba ezithandathu. Ekupheleni kwesigaba sokugqibela (isiGaba sesi-6), iingxinano ze-radionuclide

[6] Ayikho imithombo yongcoliseko lwamashishini ngaphandle kweSikhululo saMandla eNyukliya sase-Koeberg ekhoyo kummandla okufutshane wase-Duynefontein. Amashishinim aqhutywayo akhona e-Atlantis (iSikhululo saMandla se-Open Cycle Gas Turbine, imisebenzi yezitena kunye neminye imisebenzi emincinane yorhwebo) malunga nakwiikhilomitha ezili-9 kumntla mpuma, imisebenzi yetiphu e-Vissershok (iikhilomitha ezi-5 kumzantsi mpuma) kunye nendawo yokucola ipetroliyam (malunga nama-21 eekhilomitha kumzantsi-umzantsi mpuma). Izithuthi ngakwimigaqo engundoqo (umzekelo u-R27) kunye neendawo zokuhlala ezikufutshane nazo zifaka isandla ekukhupheni umoya, ingakumbi i-oksijeni idibene nezinye iziqalelo zenitrojeni. Ngelishwa, ayikho idatha yohlolo lomgangatho yomoya yembali efumanekayo e-Duynefontein. Nakuba kunjalo iphulo elifutshane leenyanga ezintathu lokuthathwa kwesampuli yomoya ye-sulfur dioxide nenitrojeni laqhutywa ukusukela ngoMatshi ukuya kuMeyi 2009. Ezi datha zakhombisa ingxinano esezantsi ye-sulfur dioxide kunye ne-nitrogen dioxide.

ezingaphantsi komphezulu ziya kuqinisekiswa kwakhona ukwanelisa iimfuneko zokukhululwa kwesiza.

Ukhetho loku "NgaseTyenziswa"

KwiSiza sase-Duynefontein

Ngaphandle kwesikhululo samandla senyukliya esicetywayo kwisiza saseDuynefontein, ukhetho "lokungasetyenziswa" ("no-go") lungafana neempembelelozyangoku zobulunga bomoya, ezithathwa ngezokubaluleka OKUPHANTSI kwiikhompawundi ze-non-radioactive yaye zinokubaluleka OKUPHAKATHI malunga kwizinto ezikhutshwa yi-radionuclide.

Iziza zase-Bantamsklip nase-Thyspunt

Ubulunga bomoya ngoku kwisiza sase-Bantamsklip buthathwa ngokuba bucoceke kakhulu ngokuphathelene nemilinganiso yezingcolisi ze-non-radioactive, ezifana ne-oxides ze-nitrogen, isulfure dioxide ne-kharbon monoxide. Naluphi uphuhliso olulolunye kwisiza lunokunyusa inani lezithuthi, lungenise imithombo yokutshisa (ii-onti, iibhoyila, izifudumezi, njl.) okanye abemi abangabantu banokuba nako ukunyusa amanqanaba yezi ndlela zezzingcolisi. Ukubaluleka kuxhomekeke kwizinto ezikhethwayo ngokutshintshisanayo, yaye zingaba nesiphumo sokubaluleka OKUPHEZULU.

Njengoko ithamo laphambi kokuqalisa langoku kwezi ziza ezibini lingaziwa, akwazeki ngokobuni ukubonelela ngempembelelo echanekileyo "yokungasetyenziswa ngokobalo lwe-radioactivity. Ngokobukho bemida yethamo eliphantsi elisekwe yi-NNR, ukukhutshwa okuqhelekileyo kungaba nesiphumo kumazinga ethamo phakathi kwamazinga okusasazeka kotshiso ngemitha awenzeka ngokwendalo. Nangona kunjalo, kwimeko yokukhutshwa ngengozi, kulindelwe ukuba ithamo linokuba ngaphezulu kwe-radioactivity eyenzeka ngokwendalo kwisiza yaye ngaloo ndlela, ngaphandle xa impahla e-radioactive isetyenziswa nakweyiphi eminye imisebenzi yophuhliso, impembelelo yeradiyo yenyukliya yokhetho "lokungasetyenziswa" ("no-go") iya kubalwa iphantsi.

IZINCOMO

- Iimpembelelo eziqikelelweyo zezinto ezikhutshwayo ezingancitshiswanga ngexesha lesigaba sokwakha ziboniswe zinokubaluleka OKUPHEZULU.
  - Uluhlu olubanzi lwezincomo lunikwe kwiCandelo 5.2.1.
  - Ezi mpembeleloz ingancitshiswa ukuya kukubaluleka OKUPHANTSI ngezicwangciso zokuphatha nolawulo lwezinto ezikhutshwayo olusemgangathweni.
  - Isicwangciso sokunciphisa izinto ezikhutshwayo sithathwa ngokuba siyafuneka apho kuqhutywa imisebenzi yokwakha kufuphi kakhulu neendawo zokuhlala nezinye izamkeli ezibuthathaka.
  - Owona mthombo ubalulekileyo (ophakathi kwama-80% nama-90%) wezinto ezikhutshwayo zothuli oludlulayo uboniswe ukuba livili lokukhwelisa kuloliwe kwiindlela ezingagangathwanga. Ngako oko, kwenziwa isincomo sokujolisa kwasekuqaleni ekunciphiseni izinto ezikhutshwayo kumphezulu wendlela. Oku kungaphunyezwa ngokumanzisa rhoqo imiphezulu engagangathwanga,

kusetyenziswa imichiza yokuthomalalisa uthuli, okanye ngokona kukhethekayo, ngokufaka itela kwimiphezulu yendlela.

- Kwimimandla apho ukufaka itela kungelulo ukhetho olunokwenzeka, kufuneka isicwangciso solawulo sibe neeshedyuli zokumanzisa iindlela ezingagangathwanga, okungenani, kwakunye neminye imisebenzi enokunciphisa ngezitshizi zamanzi.
- Ukongeza ekulungisweni komphezulu wendlela, kukhuthazwa ukusebenzisa uluhlu lokuhlola ulawulo lokunciphisa xa kusakhiwa, olunikwe kwiSihlomelo D, okanye ingxelo yalo elungiswe ngokufanelekileyo.

- Inkqubo ekhuthazwayo yokuhlola ubulunga bomoya ebonelelwe kwiCandelo 4.2.1 kufuneka ngokukhethekayo iqaliswe kunyaka phambi kokwakha. Oku kungabonelela ngesiseko esaneleyo saphambi kokuqalisa sengxinano yomoya esinokufakelwa kuwo onke amaxesha onyaka. Le nkqubo kufuneka iquke zombini iikhompawundi eze-non-radionuclide neze-radionuclide (njengoko kuxeliwe yi-NNR).
- Awekho amanyathelo okunciphisa awongezelelweyo afunwayo ezinto ezikhutshwayo zemisebenzi yesiqhelo yee-radionuclide. Nangona kunjalo, sakuba sithathiwe isigqibo sokugqibela sobuchwepheshe besixhobo sombane, kufuneka i-Eskom iqinisekise ukuba izinto ezikhutshwayo kubuchwepheshe obukhethiweyo zihambelana nemvulophu esetyenziswa kolu vavanyo kwanokuthi izinto ezinjalo ezikhutshwayo zingagcinwa kumjikelo wonke wobomi besikhululo samandla senyukliya. Oku kuquka uvavanyo olunzulu lokuthembeka nolondolozo lokusebenza ngobuchule obuphezulu kwezihluzi zamasuntswana emoyeni (high efficiency particulate air) (HEPA) eziya kusetyenziswa ukulawula izinto ezikhutshwayo zomoya zotshiso ngemitha ezivela kwisikhululo samandla senyukliya.
- Ngokufanayo, umthengisi ophumeleleyo wobuchwepheshe kufuneka abonise ukuba izinto eziphuma ngokuzenzekela nangengozi zingahambelana njani neemfuneko ze-NNR yaye ezi zingagcinwa njani ziPhantsi kaNgangoko kungaFikelelwa noKwamkelekile (As Low As Reasonably Achievable) (ALARA).
- Impembelelo ngexesha lesigaba sokurhoxisa zivavanywe ngokobulunga ngokusekwe ekuthatheni ukuba isicwangciso sokurhoxisa siya kufana neso esiphuhliselwe isikhululo samandla senyukliya sase-Koeberg. Isicwangciso sokurhoxisa esijongene ngqo nesiza kufuneka siphuhliswe ngezona mfuneko zakutshanje ezixelwe yi-NNR.
- Kuya khuthazwa ukuqinisekisa ukuba izinto ezikhutshwayo ezivela kwiijenereitha zamandla zokuxhasa njengamalalela zisebenza ngokobalulo lomthengisi, ezo uvavanyo belusekwe kuzo. Nangona uhlolo oluqhubekayo lwezinto ezikhutshwayo (continuous emisions monitoring) (CEM) lunokukhetheka ngokubhekiselele kumasuntswana nee-oxide zenitrogen, amaphulo okuthatha iisampulu rhoqo kwiingqumba anokwanela njengoko imo yokusebenza ineziqabu. Kukhuthazwa ukuba amaphulo amathathu okuqala okuthatha iisampulu ze-isokinetic kufuneka kananjalo aquke uhlalutyo lwe-sulfure dioxide.
- Ukwenza umzekelo wosasazo lomoya kufuneka uphindaphindwe kusetyenziswa imimiselo yomthombo wezinto ezikhutshwayo eziqhelekileyo neziphazamisayo zomthengisi ophumeleleyo kwakunye nedata yemozulu kwisiza phambi kokwakha isikhululo samandla senyukliya. Ufaniso kufuneka kuphindaphindwe ngokuphathelele kuzo zozibini izinto zomoya ezikhutshwayo ze-non-nuclear ne-radionuclide. Ngaphezu koko, indlela yokusebenza yokubala ithamo kufuneka

yenziwe ngokwemigangatho yakutshanje yezizwe ngezizwe kwakunye neemfuneko ze-NNR.

1.10 A UHlolo lweNzululwazi ngeziTyalo noPhononongo ngeziNto eziPhila kwiNgqumba yeNtlabathi ngaseluNxwemeni (Appendix E11)

Okufunyanisiweyo kuphando

Uhlolo lokuqala lweenkqubo zeengqumba zentlabathi ezisukayo e-Koeberg (Phantsi, 2011) lwafumanisa ukuba iimpembelelo ezinxulunyaniswa ne-NPS zinokuba mandundu kakhulu. Kwenziwa isincomo sokuba nawuphi na umlinganiselo wemfuno yoluntu ubekwe kwi-1,5 yeekhilomitha kumhlaba ophakathi ukunxweme ukuphepha iingqumba zentlabathi ezibuthathaka ezinqamlezileyo.

Kwiminyaka esixhenxe elandelayo ukususela kolu phononongo (umsebenzi wangaphadle owaqhutywa kuqala ngo-2007/8) iingqumba zentlabathi ezinqamlezileyo ziye zazinza ngokwazo ukuya kuma apho, oko kucebisa ukuba zinokulungela uphuhliso.

Uhlolo lwemihlaba, izihluma nezityalo ngakwithambeka kwintlabathi engumkhuthuka ukuya kwiindawo ezintsha ekungenelele kuzo izinto eziphilayo kwaye zisanda, ukuya kwawona matyholo nemithi emininzi, kubonise ukonyuka kwiintlobo zezityalo, ubukho jikelele nobude. Imihlaba engaphantsi kwamatyholo kunye nemithi emidala ibonise amanqanaba amakhulu ezondli kunye namandla okutshintshisana omxube wamanzi omhlaba, uninzi loku kunxulumana namanqanaba aphezulu e-organic carbon esebenza njengesabstensi eneemolekhule ezinkulu kwimihlaba eyintlabathi.

Ukwenziwa kweemaphu zeefoto ezithathwe phezulu ukusukela ngo-1938 ukuya ku-2014, kukhombise ukuba iingqumba zentlabathi ezinqamlezileyo bezikhula ngesantya esifanelekileyo. Intlabathi engumkhuthuka ibinise ilahleko eyokuma kuma-637 eehektare nokunyuka okuhamba kunye ukuba amatyholo namahlathi akuma (401 eehektare). Uphuhliso lubalelwe kuma-265 eehektare. Ayikuko nje kuphela ukuba inkqubo yeengqumba zentlabathi “yehlela phantsi” kodwa ukukhula ngokuzenzekelayo kwale nkqubo kuncedwe kukwehla kwengqumba zentlabathi ezisukayo, ngokuMiswa kwe-Koeberg kumbindi wolwandle lwentlabathi eyondla iingqumba zentlabathi ezisukayo, ngokunjalo ne-Melkbosstrand kumjelo ongundoqo ohambisa intlabathi.

Izincomo

Low (2011) kwingxelo yakhe ngeengqumba zentlabathi kunye nenzululwazi ngezityalo kwisiza sase-Koeberg, wenze isincomo sokuba kubuyiselwe emva umgca oza kubeka nasiphi na isikhululo senkukliya esicetywayo ngaphaya kwebala lengqumba yentlabathi esukayo, njengakwi-1,5 yeekhilomitha phakathi kumhlaba wonxweme. Eso sincomo simele iindawo eziseneengqumba zentlabathi ezisukayo, kodwa ulwazi olungaphaya lwakutsha nje olufakwe kolu phononongo lucebisa ukuba siqwalaselwe kwakhona isimo, ingakumbi xa kujongwa uzinzo lwengqumba zentlabathi kumntla nje weSikhululo saMandla esele sikhona.

Imiba emibini ebalulekileyo kule ngxoxo-mpikiswano: (i) ilahleko enkulu ekusukeni kweengqumba zentlabathi ngenxa yophuhliso kumazantsi, okuhamba nokonyuka kobukho bezityalo kuthethe ukuba iingqumba zentlabathi ngeke zibe sasebenza

ngokwesimo sazo zokuqala kwaye (ii) uphuhliso lunokwenziwa kwiindawo ezilinyiweyo zendawo yengqumba yentlabathi, oko kusenza ukuba inkqubo encinane eseleyo esukayo kumntla isebenze ixesha elide, nangona inyinwe ngokwenziweyo.

Low (2011) unika izimvo: “Ukwakhiwa kwesibonelelo senyukliya kunokukhokelela kwilahleko yenkqubo enkulu yeengqumba zentlabathi ezinqamlezileyo, enyinelwe kumazantsi oNxweme lweNtshona yeKapa. Le nkqubo ithiwe thaca ngokulambathayo kummandla, nangona kukho ithafa elikhulu leengqumba zentlabathi ezinqamlezileyo kumntla-mpuma we-Witzand kunye nefana nayo, kodwa enkulu kumntla we-Yzerfontein. Inkqubo yase-Duynefontein iyamangalisa ngobukhulu bayo (phantse ibe li-1 000 leehektare) kwaye ime kunxweme, ngasentla nje kweengqumba zentlabathi ezingundoqo. Ngaphandle kwesikhunda sangoku seSikhululo saMandla sase-Koeberg ukuya kumazantsi, kunye nasekuqaleni kwale nkqubo, ngalo ndlela kusenza ukuba kuhleleleke ukuya kwentlabathi kumantla (jikelele icala eliya kuyo intlabathi), uqwalaselo lwemimandla, kunye nolo lwengcali ephonononga umphezulu womhlaba, kuqinisekisa ukuba kukho ukusuka okubonakalayo kwentlabathi yangaphakathi emhlabeni isuka kumzantsi ntshona, oko okucebisa ukuba kukho into efana “nolungiso" kwinkqubo, okanye umthombo womzantsi ntshona ubukhona ubude bexesha elithile”.

Kwiminyaka esixhenxe esukela kuphononongo lokuqala, kucacile ukuba uphuhliso kunye nokutyalwa kweengqumba zentlabathi ezinqamlezileyo ezinokusuka esebenzayo kuphazamisene nokusuka kweengqumba zentlabathi kwaze kwakhokelela ekubeni inkqubo “icothe”. Okufunyanisiweyo ekuzinziseni iingqumba zentlabathi kukuba oku kuza kuqhuba kwikamva elibonwa ngenx'engaphambili, kuba ubukho bentlabathi buyoma, kwaye izityalo ezizikhulelayo ziyanyuka.

Ngoko ke isincomo sale ngxelo, sesokuba ukwakhiwa kwendawo ecetywayo yeNyukliya ithathelwe ingqalelo kwinxenye eLINYIWEYO kwaye EZINZISIWEYO yeengqumba zentlabathi ezinqamlezileyo, kodwa kusetyenzwa ngamagatya angaphantsi kwecandelo elilandelayo.

Nayiphi na ilahleko yeengqumba zentlabathi ezinqamlezileyo kufuneka izinziswe ngokongezwa kwezityalo kumntla womda weNdawo yoLondolozo Ndalo yase-Koeberg (njengeFama yase-Groot Springfontein).

Ukusabela ekuzinziseni iingqumba zentlabathi ezinqamlezileyo kwiimpembelelo

Isigaba sokwakha isibonelelo seNyukliya

Imihlaba

Njengoko zikhula izityalo, linjalo nenqanaba le-organic carbon kunye nezondli ezininzi (jonga ngasentla). Imihlaba engaphantsi kwamatyholo kunye nemithi ekwiingqumba zentlabathi inezixa ezilngalinganiyo eziphezulu zekhabhoni kunye nezondli kunentlabathi engumkhuthuka kunye neqela lezinto eziphilayo ezingena kwindawo entsha. Emakuqatshelwe kukuba umlinganiselo wamandla omhlaba wokubamba nokukhulula izinto ezithile kunye nobukho bezondli okuqinisekisa iyantlukwano enkulu yezinto eziphilayo kunye nakwiqela lezityalo ixhathisa kakhulu ekuphazamisekeni. Ukuzinza komhlaba kuqinisekisa nge a) zixa eziphezulu kwinxenye yomhlaba enezityalo nezilwanyana kunye nokuhlangana komhlaba kunye b) neekanopi ezixineneyo ezikhusela intlabathi emoyeni. Ngokungqinelana,

iingqumba zentlabathi zendalo ezinqamlezileyo ukulinywa nokusuka kwazo kusezantsi, ukuphephethwa kwazo ngamaza ngokume nkqo kwicala lomoya (jonga ngezantsi uze ungqinisise ku-Illenberger, 2013).

Izihluma

Iintlobo ezingama-87 zezihluma ziye zabonwa kwiingqumba zentlabathi ezinqamlezileyo kolu phononongo, ezili-10 ngaphezulu kwezomsebenzi ka-Low's (2011) (jonga i-SaSFlora, 1998–2015). Zombini ezi ngxelo zophononongo le kunye neka-Low (2011) zixela iintlobo ezintlanu ezikuLuhlu oluBomvu, zonke ezisasazeke kwiingqumba zentlabathi zoNxweme oluseNtshona nakwezinye iindawo (sensu SaSFlora, 1998–2015). Ilahleko kumlinganiselo wemfuno yoluntu kwi-NPS yiloo ngo ithathwa ngokuba incinane.

Izityalo kunye nozinzo lweengqumba zentlabathi

Izityalo zesiza zimelwe kakuhle kwenye indawo kuNxweme oluseNtshona nakwi-Tape Flats. Nakuba kunjalo, inkqubo etshintshayo, enokungenelela okungekuko okwendalo (okwenziwa kukuzinzisa okwenziweyo) okususa ezi ngqumba zentlabathi kuzisa ngakumatyholo nemithi emidala. Ezi zityalo ezide eziyinxenye yeengqumba zentlabathi ezayameneyo (Low, 2011), apho amatyholo kunye nemithi exineneyo inika uzinzo olukhulu kuneengqumba zentlabathi ezinqamlezileyo.

Ukuguqulwa kwale nkqubo kuza kufuna ukususwa kwezityalo kwiingqumba zentlabathi kwaye nalapho ngeke kubuyele kwisimo sako sendalo kuba ukuhamba kwentlabathi evela kumzantsi kuvalelwe yi-Koeberg ngokwayo, kunye nayiyo, i-Melkbosstrand. Oku kuphinda isimo senkqubo kumhlaba ongundoqo we-Oyster Bay-Cape St. Francis, apho uphuhliso kuleyo yayisakuba yidolophu luthintela intlabathi ekubeni yondle le nkqubo inkulu yengqumba yentlabathi (Illenberger, 2010; Low, 2011).

Iimpembelelo ezinxulumene nokwakhiwa kwesibonelelo seNyukliya kwiingqumba zentlabathi ezazisuka ngaphambili kuye kwasetyenzwa ngazo kuhlolo lweempembelelo ezingundoqo (Low, 2011). Kule ngxelo u-Low (2011) wenza isincomo sokuba kungabikho phuhliso kwiingqumba zentlabathi ezisukayo, ingakumbi inkqubo enqamlezileyo kumntla we-Koeberg, kunye nokuba uphuhliso olunjalo lusiwe kumhlaba ongaphakathi kwiingqumba zentlabathi eziyinxenye yezinye ezizinzileyo. Ngokucacileyo iingqumba zentlabathi ezikumantla esikhululo samandla esele sikhona ngoku zizinziswe kakuhle (Imifanekiso owama-23 nowama-24) kwaye indlela elandela izityalo ibhekisele ngakumatyholo nemithi exineneyo, ngoku ezivela zizipetshi kummandla xa uwonke (jonga u-Low, 2011 ngokunaba kweentlobo zezityalo).

Ngokutyala kwezo ndawo zazisakuba ziingqumba zentlabathi olu zinzo lutsha luza kuthetha ukuba uphuhliso lunokuthathelwa ingqalelo, kodwa ngamanyathelo emfuduko eengqumba zentlabathi ayinxenye yokunye. (Low, 2011).

Ukulungiswa ngononophelo komlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni

Kubalulekile ukuba kungavunyelwa umlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni kwinkqubo yeengqumba zentlabathi ezinqamlezileyo ezisukayo. Kunoko kufuneka kuthathwe ukhathalelo lokuqinisekisa ukuba umda kumlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni lukwiingqumba zentlabathi ezizinzileyo. Ukongeza, kufuneka ubuncinane kubekho ukhuselo oluli-100 leemitha phakathi komda kunye nayo nayiphi na ingqumba yentlabathi esukayo.

Isigaba sokusebenza sesibonelelo seNyukliya

Ukubuyiselwa emva konxweme kunye nezikhuseli

Isivumelwano esingundoqo ekwafikelelwa kuso phakathi kwabalawuli be-Eskom kunye neqela elidibana nabantu yaba lulungiselelo lwepaseji emxinwa eselunxwemeni ebubanzi ibubuncinane bama-200 eemitha (jonga u-Low, 2011). Oku kufuneka kusetyenziswe apha kwaye kuya kuqinisekisa ukuba ezona zibuthathaka kakhulu nezisukayo iingqumba zentlabathi ezinggunoqo ziyaphetshwa.

U-Low (2011) ubhale uluhlu lwezikhokelo zolawulo kunye nokubuyisela kwisimo sangaphambili kwisigaba sokusebenza seprojekthi eziqukiweyo apha. Ezi kufuneka kubanjelelwe kuzo kwaye ziqukwe njengenxenye yerekhodi lezigqibo ukuba ngaba inokunikwa imvume yesinye isibonelelo seNyukliya e-Koeberg.

Ulondolozo

Ngokufutshane, iingqumba zentlabathi ezinqamlezileyo ziyinxenye yohlobo lwezityalo ze-Cape Flats Dune Strandveld ethathwa ngokuba isengozini yokuPhela (Rouget et al., 2004). Le nkqubo ikhuselwe ngokukuko kuma-3 000 eehektare zeNdawo yoLondolozo Ndalo yase-Koeberg kunye nakwiinxenye ezahlukeneyo ze-Cape Flats noNxweme oluseNtshona. U-Low (2011) uyaziqonda iimpembelelo ezintle kuphuhliso lwesibonelelo seNkyukliya esitsha: “Ulawulo oluqhubayo lweNdawo yoLondolozo Ndalo yase-Koeberg, oluphathelene nesiza xa sisonke ngaphandle kwe-NPS ekhoyo, ithathwa ngokuba ziimpembelelo ezintle. Ukusetyenziselwa izinto ezininzi okukhoyo ngoku kwindawo yolondolozo kunabile kwaye abalawuli baya kuqhuba nge-NPS entsha. Ukwandiswa kwendawo yolondolozo ndalo ibe lithafa lengqumba yentlabathi esemgangathweni leFama yase-Groot Springfontein ukuya kumntla nako kunqweneleka kakhulu, kwaye kunokwenziwa kusebenze ngesivumelwano sentsebenziswano solondolozo. Kuko konke ukusetyenziswa kwama-200 ukuya kuma-280 eehektare athile kwi-NPS kodlulwa ngama-3 000 eehektare okwangoku aphantsi kolondolozo kwiNadwo yondolozo ndalo yase-Koeberg”. Apha ndingongeza ukuba ukuqalisa okunxulumene neentlobo ezithile zezinto eziphilayo kunye neendawo eziphila kuzo kufunelwe ilahleko enokuba khona yeengqumba zentlabathi ezinqamlezileyo kumazantsi esiza, kunye nokuba iFama yase-Groot Springfontein kumda okumantla e-KNR inokuba sisongezo esinexabiso, ingakumbi njengokuba ilele kwintshona ka-R27, ifaka unxweme olungazange luchukunyiswe olusekwisimo sokuqala kwaye luya kudityaniswa ngqo kwiNdawo yoLondolozo ndalo yase-Koeberg.

Amangenelelo angundoqo ngexa lokwakha kunye/okanye izigaba zokusebenza (ubuninzi buthathwe ku-Low, 2011)

Ukukhangela nokuhlangula

Kwisigaba ngasinye sokwakha kwithafa lendalo, umsebenzi wokukhangela nokuhlangula uyafuneka oza kuchonga zonke izityalo mhalwumbi ebezinqabe ngokugqithisileyo (eziPhelayo okanye ezinokuPhela ngamandla) okanye ezinokusetyenziswa ukubuyiselwa kwesiza kwisimo sangaphambili. Iintlobo zoLuhlu oluBomvu ekunokwenzeka ukuba zichaphazeleke ukuba uphuhliso luyaqhutywa kwiingqumba zentlabathi ezinqamlezileyo, yi-annual *Capnophyllum africanum*, Helichrysum cochleariforme duineteebossie (Near Threatened – NT), *Psoralea repens* duine-ertjie (NT), i-succulent vygie *Ruschia indecora* (ePhelayo (Endangered) – EN), kunye ne-asserina ericoides kusgonnabas (Vulnerable – VU) (Isimo soLuhlu oluBomvu kwizibiyeli) (jonga iSihlomelo sesi-2). Iintlobo ezinjalo ezikwi-RL zinokufuna ukuba zichongwe yingcali ngenzululwazi yezityalo eya kuqinisekisa ukuba kukho isicwangciso esisebenzayo sokususa izityalo ezikhankayiweyo phambi kokuba kuqale ukwakhiwa. Izityalo ezinesitswele okanye isiqu sengcambu zinethuba elikhulu lokumila emva kokufuduswa, ngexa amatyholo kunye nezinye izityalo ezifana nengca (ingca, imfe yesele, izityalo eziluhlaza ezifana nengca), ingakumbi izityalo ezitshiswe ngumlilo, ngeke zisiwe kwenye indawo ngempumelelo. Imbewu kunye/okanye iziqu ezisikwe kwisityalo esikhulu kufuneka zisuswe kwiintlobo zezityalo ezingeke zifuduswe ngokulula kwaye zilinywe kwisiza somyezo wezityalo (njonga ngezantsi).

Isicwangciso sokubuyisela kwimo yangaphambili

Kunxulunyaniswe nokuKhangela nokuHlangula ngasentla kufuneka kubekho isicwangciso sokubuyisela kwisimo sangaphambili esiza kwenza ukuba yonke imimandla ephazamisekileyo kuphuhliso lwesibonelelo esicetywayo ibuyiselwe kwisimo sangaphambili esonelisayo neentlobo zemveli ezikhoyo kwingingqi. Oku kunokuquka ingqokelela yemathiriyeli efanelekileyo yezityalo phambi kokuba kuqwaliswe ukwakha, ukugcinwa kwemathiriyeli enjalo kunye/okanye ukutyalwa kwemathiriyeli efanelekileyo. Izityalo kufuneka zibe neminyaka emibini ukuya kwemithathu ubudala ukuze zisetyenziselwe ukubuyisela kwisimo sangaphambili kwaye ukuthathwa kweesampuli kufuneka kuqale ngexa lethuba lokwakha, ubuncinane beminyaka emithathu phambi kokuqaliswa komzi-mveliso we-NPS. Isitiya sezithole esiza kuhlala izityalo ezigciniweyo nezilinyiweyo siya kuba yimfuneko engundoqo ekoneliseni ukuzibuyisela kwisimo sangaphambili. Ngale njongo isicwangciso sokubuyisela kwisimo sangaphambili siya kuzotywa esiya kuchonga iintlobo ezifanelekileyo, indlela yokugcina kunye/okanye ukwandisa, indlela yokutyala kunye nokulondoloza, kunye nokuhlola impumelelo yokubuyisela kwisimo sangaphambili (jonga ngezantsi). Oku kunokuqukwa njengenxenye yokwakhiwa kunye nokusebenza kwe-EMP.

Isicwangciso esibanzi sokubuyisela kwisimo sangaphambili siya kufuna iinkonzo zokubuyisela kwisimo sangaphambili zengcali kunye nengcali yenzululwazi ngezityalo abaya kuchonga kwaye babone iintlobo zezityalo ezifanelekileyo; kufuneka kuthathwe amanyathelo afunekayo ukuqinisekisa ukuba ukususwa

kwezityalo ezikhankanyiweyo phambi kokuba kuqalwe ukwakhiwa. Imbewu kunye/okanye iziqu ezisikwe kwisityalo esikhulu kufuneka zisuswe kwiintlobo zezityalo ezingeke zifuduswe ngokulula kwaye zilinywe kwisiza somyezo wezityalo.

Isicwangciso kufuneka siquke le miba ingundoqo ilandelayo:

Isigaba sokulungisa
Ubuncinane beminyaka emibini phambi kokuqala ukwakha, isitiya szithole esikwisiza esinomphathi kufuneka simiselwe e-Duynefontein. Uluhlu lwentlobo zezityalo ekufuneka zikhutshwe kwaye zombini imbewu kunye neziqu ezisikwe kwisityalo esikhulu ziqokelelwe, zityalwe zize ziqiniswe ngokufanelekileyo. Oku kuya kunika imathiriyeli esele ilungele ukutyalwa kuba imimandla kufuneka ukuba ibuyiselwe kwisimo sangaphambili. Ukongeza intlobo ezithile zezityalo zinokufuduselwa kwisitiya sezithole. Ubungakanani bemathiriyeli yesityalo efunekayo iya kukhokelwa bububanzi bokwakha kunye nayimimandla eza kuphazanyiswa. Zombini ezo ntlobo zihlala emhlabeni kunye nasemigxobhozweni kufuneka zithathele ingqalelo.

Uluhlu lweentlobo zezityalo ezifanelekileyo ukuba zibuyiselwe kwisimo sangaphambili lunikiwe.

Umhlaba ongaphezulu
Esi mhlawumbi sesona sigaba sibalulekileyo sokubuyisela kwisimo sangaphambili kwaye siya kumisela kakhulu impumelelo ekugqibeleni yawo nawuphi na umsebenzi wokubuyisela kwisimo sangaphambili.

- Umhlaba ongaphezulu (0–300 mm ubunzulu) kufuneka ususwe kuwo nawuphi na ummandla ophazanyiswa okwexeshana okanye isigxina, kwaye ubekwe uyingqumba. Ingqumba kufuneka zingabikho ngaphezulu kwe-1,5 ukuya kwisi-2 seemitha ukuphakama ukuphepha ukwehla kokungena komoya, kodwa kwakhona ukubola ngokukhawuleza kwe-organic matter, le yokugqibela yimfuneko ukunika isiqalo esilungileyo kwizityalo ezitsha.
- Iingqumba zomhlaba kufuneka kwiimimandla ebiphazanyisiwe ngaphambili kwaye ngokuqinisekileyo zingabekwa kwizityalo zendalo. Oku kunokukhokelela ekufeni kwale yokugqibela.

Ukutyala
- Ukutyalwa kweentlobo zezityalo ezilinywe kwisitiya sezithole kunye nezo zifuduselwe kwenye indawo kufuneka kwenziwe kwingxinano emiselwe yingcali yokubuyisela kwisimo sangaphambili, kodwa jikelele hayi ngaphantsi kwesi-1 semitha ukwahlukana. Ixesha lokutyala kufuneka libe phambi kokuqala kwexesha lonyaka elinemvula eNtshona Koloni (Epreli/Meyi) ukuze izityalo zinikwe zibe neemeko ezilungileyo zokufuma phambi kokuqala kwexesha lasehlotyeni emva kweenyanga ezintandathu.

Isigcina kufuma emhlabeni
- Isigcina kufuma emhlabeni kufuneka sisasazwe kwindawo ezilinyiweyo kwaye oku kufuneka kube ngumthuzi womhlaba, kwaye kunike umthombo we-organic matter kunye nezondli ezithile, ngokunjalo nokugcinwa komfumo kwizityalo ezitsha. Owona mthombo ugqwesileyo wesigcina kufuma yi-acacias

ekhoyo kwingingqi kwaye inokugcina ukufuma kwisiza emva kokusikwa. Kufuneka kuthatwhe ukhathalelo lokuba ingasuswa le mithi ingaqhelekanga xa kulungiselwa imbewu (Oktobha ukuya kuNovemba kwi-Acacia saligna Port Jackson willow).

UkuGcina

- Imimandla esanda kutyalwa kufuneka isuswe ukhula rhoqo. Apho zifa khona izityalo, izityalo ezifileyo kufuneka kungene endaweni yazo imathiriyeli evela kwisitiya sezithole. Izityalo kufuneka zinkcenkceshelwe ngexa lokuqala lethuba lasehlotyeni. Ngale njongo inkqubo elula engaphezu komhlaba yokunkcenkceshela inokungqina ukuba iluncedo ukuba ayiyomfuneko.
- Zonke izityalo zangaphandle ezinemithi kufuneka zisuswe zakufikelela kubude bedolo (ukwenza lula ukuzitsala).

Ipaseji emxinwa yonxweme nezithinteli

Imiba emibi yokwakha isibonelelo senyukliya elunxwemeni (njengakwiindawo ezinamanzi aphezulu (HWM)) kuxoxiwe ngazo ngu-Low (2008) kumzi mveliso ocetywayo we-PBMR (ukusukela ekuyekweni njengokhetho) kwaye ngokwembali ibikhona kwiSikhululo saMandla eNyukliya sase-Koeberg. “Ezi ndawo zokuhlala zinobuthathaka ngokugqithisileyo kwaye ziethe-ethe kwaye azifuna ukuzifaka emngciphekweni omkhulu ukuba zombini iindawo zokuhlala kunye nemiba efana nokugcinwa kwezakhiwo kufuneka kujongwane nazo ngokonelisayo. Ukubuyiselwa emva komgama kufuneka kuphunyezwe ….”

Ipaseji emxinwa ye-EIA kufuneka yohlulwe kuphawu lwamanzi aphezulu yipaseji emxinwa yonxweme kunye nesithinteli esaneleyo kwiingqumba zentlabathi ezisukayo ezibuthathaka, nokuba yeyiphi na enkulu. Ipaseji emxinwa enjalo kufuneka ithathele ingqalelo le mithetho okanye indlela ilandelayo yonxulumano lwezinto eziphilayo:

- Ipaseji ebubanzi bungama-200 eemitha yonxulumano lwezinto eziphilayo njengobuncinane bobubanzi eza kusebenza njengomjelo wokuthutha amanzi kwiintlobo zezityalo ekumvumvuzeleni kunye nasekuthutheni iziqhamo kunye nommandla ovumayo kwinkqubo ezinokuba khona zonxulumano lwezinto eziphilayo ezifana nokusuka kweengqumba zentlabathi kunye nommvumvuzelo, kunye nokulondolozwa kwentlobo ezingundoqo. E-Koeberg oku kuya kuba banzi kakhulu ukuba izincomo zokuphepha inkqubo yeengqumba zentlabathi ezinqamlezileyo ezibuthathaka, ezinqabileyo nezinyinelwe kumamndla othile zigciniwe;
- Ukuphepha iingqumba zentlabathi ezingundoqo ezibuthathaka elunxwemeni;
- Ukuphepha amawa abuthathaka kwilitye lekalika elikummandla okumntla;
- Nokuba ngowuphi umgama wokubuyisela emva ongowona okude kwi-HWM, isithinteli esongezelelweyo se-100 leemitha kufuneka simiselwe ukukhusela iinkqubo ezibuthathaka ekuxoxwe ngazo ngasentla kuzo nakweziphi na impembelelo zexesha elide; kwaye
- Yonke imigama ebuyiselwa emva kunokufuneka ukuba icandwe ngokuchanekileyo phambi kokuba umlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni ulungiselelwe ngononophelo.

Iimpembelelo zophuhliso kunxweme zinokubeka emngciphekweni ipaseji emxinwa esele ikhona, e-albeit de facto, ngakuNxweme leNtshona Koloni, leyo kwingingqi inabela ngeekhikhilomitha ezininzi emhlabeni. Umgama obuyiselwa umva wama-200 eemitha ugcine ipaseji enjalo emxinwa yonxweme ekuNxweme oluseNtshona (Low, 2011).

Ukuhlola

Ukubuyisela kwimo yangaphambili

Injongo: ukuqinisekisa ukubuyiselwa kwisimo sangaphambili kweentlobo zezityalo zemveli kwenziwa ngokunempumelelo kwaye kunozinzo lwexesha elide

a Imimandla engangenelelwanga

Apho izinto ezihlala kwindawo ziphazanyiswe ngokungekuko okwendalo kodwa zibe zingangenelelwanga yi-*Acacia cyclops* rooikrans, ukubuyiselwa kwisimo sangaphambili ngeentlobo zezityalo zemveli kuya kuphunyezwa. Ukubuyiselwa kwisimo sangaphambili okunjalo kufuneka kulandele isicwangciso esihlanganiswe yingcali yokubuyisela kwisimo sangaphambili, incediswa yingcali yeenzululwaizi ngezityalo enolwazi lokusebenza olugqwesileyo ngezityalo zengingqi, kwaye isebenzisa iintlobo zeityalo ezikhula kwingingqi. Iinkcukacha zesicwangciso zithiwe thaca kwicandelo (v) ngasentla. Impumelelo yokubuyisela kwisimo sangaphambili kufuneka ihlolwe ngokusekelwe kwiinyanga ezintathu kunyaka wokuqala, kuze kube kwiinyanga ezintandathu de ibe ingxinano yeentlobo zezityalo eyamkelekileyo kunye nobukho buphunyeziwe.

b Imimandla engenelelweyo

Imimandla engenelelwe yi-*Acacia cyclops* rooikrans okanye yi-*Acacia saligna* Port Jackson willow kufuneka isuswe ize ibuyiselwe kwisimo sangaphambili ngokwencomo eziku- (v) ngasentla. Ukubuyisela kwisimo sangaphambili kufuneka kuphunyezwe kuphela ukuba iintlobo zezityalo zamatyholo nemithi azibuyeli ngokwendalo kwisimo esinqwenelekayo kunye nakwiintlobo zezityalo ezihambisana nazo. Le miba mibi yakamva kufuneka ijongwe yingcali yenzululwazi ngezityalo kunye nalujoliso olumiselweyo kuzo zombini ezi ndlela; oko kufuneka kuqukwe kwisicwangciso sokubuyisela kwisimi sangaphambili.

Ngexa kusenziwa isincomo esingamandla sokuba isuswe ngezandla i-rooikrans – ngokwazo zozibini izizathu ezasekuhlaleni kunye nezinxulumene nezinto eziphilayo – abantu abasusa i-acacias kufuneka baxhomekeke kwimigaqo yokuziphatha eza kulawula ukuziphatha kwisiza. Imiba engundoqo inokuquka umonakalo kwizityalo kunye nezilwanyana, izindlu zangasese, umlilo, kunye nokuziphatha jikelele ukuba kuhambelane noko kwendawo yolondolozo ndalo. Imisebenzi yaba bantu kufuneka ijongwe ngumphathi okwisiza okanye umlawuli wendawo yolondolozo (jonga ngezantsi).

(ii) Ipaseji emxinwa yonxweme

Injongo: ukuqinisekisa ukuba ipaseji emxinwa yonxweme yakhiwa ngendlela efanelekileyo kwaye iyalondolozwa kwixesha elide

Ukuphunyezwa kwepaseji emxinwa yonxweme kufuneka ibe yinjongo engundoqo ekuphuhlisweni kwesibonelelo senyukliya. Ukuhlola kufuneka kuphunyezwe ukuqinisekisa ukuba ipaseji emxinwa yonxweme igcinwa kwisimo sendalo kangangoko kunokwenzeka. Oku kunokuquka ukuhlolwa kokubuyiselwa kwisimo sangaphambili semimandla eyembiweyo yemibhobho engenisayo kunye nekhuphayo kunye nendawo ekufutshane nesakhiwo senyukliya. Ukubuyisela kwisimo sangaphambili kwiintlobo zezityalo zemveli kufuneka kwenziwe kusetyenziswa isicwangciso sokubuyisela kwisimo sangaphambili esichazwe ngentla.

Ukufuduswa kunye/okanye ukutyalwa kweentlobo zezityalo ezikuLuhlu oluBomvu

Injongo: ukuqinisekisa ukuba pho kwenzekayo zonke iintlobo zezityalo ezikuLuhlu oluBomvu ingakumbi ezo zikwiiNdidi ezingaKhuselekanga kunye neziPhelayo ezichatshazelwa luphuhliso ziyafuduswa okanye zilinywe ngempumelelo kwisitiya sezithole zize zibuyiselwe endle

Ukufuduswa kunye/okanye ukulinywa kweentlobo zezityalo ezikuLuhlu oluBomvu kufuneka kuqukwe kwisicwangciso sokubuyiselwa kwisimo sangaphambili sesiza. Indlela engundoqo yokusebenza iquka ukutyalwa kwakhona kweentlobo zezityalo ze-RL kwimimandla ekhuselweyo, mhlawumbi kwisiza okanye kwiindawo zolondolozo ndalo ezikufutshane, okanye ukutyalwa kweentlobo ezinjalo zezityalo ukuze zifakwe kwiindawo ezikhula kuzo zendalo oko kusenziwa ngesicwangciso sokubuyiselwa kwisimo sangapha,mbili. Okungamandla iya kuba kukuqinisekisa ukuba akuyo kuba kuncitshiswa kwingxinano kunye nobuninzi bendalo kulo ngalunye uhlobo lwe-RL.

Isimo sommandla wolondolozo

Injongo: ukuqinisekisa ukuba imimandla yendalo yeNdawo yoLondolozo Ndalo yabuCala yase-Duynefontein/Koeberg igcinwa ikwisimo esifanayo neso seendawo zolondolozo ndalo ezilawulwa kakuhle

I-Koeberg kufuneka iqhube nenkqubo yayo yolawulo yangoku kwaye iqinisekise ukuba isicwangciso solawulo sommandla siyaphunyezwa. Imimandla engundoqo yokusebenza inokuba: kukususwa kwezityalo zangaphandle eziyimithi, ukubuyisela kwisimo sangaphambili, ukwakhiwa kwendlela etyhutyhayo yoluntu, ulawulo lokungena kunye nokusetyenziswa kommandla, ulawulo lwezithuthi ezingena kummandla.

Iziphetho

Kolu phononongo, utshintsho olungundoqo lwarekhodwa kwinkqubo yeengqumba zentlabathi ezinqamlezileyo kumntla wesibonelelo seNyukliya sase-Koeberg esele sesikhona.

Ukuthathwa kweemaphu zemifanekiso yasemoyeni ngaphezu kwethuba leminyaka engama-76 kubonise ngokugqibeleleyo ukuba ezo ngqumba zentlabathi zinqamlezileyo zazisuka zikhula ngesntya esikhawulezayo kwaye azisasuki kumazantsi. Oku kuboniswe ngokwehla kwintlabathi engumkhuthuka (ukususka)

kunye nokonyuka kwizityalo zamatyholo nemithi kunye nezinye iintlobo zezityalo (ukuphela kokusuka).

Okukhapha okungentla, kuye kwakho ukonyuka kwiintlobo zezityalo kunye nokukhula kwazo, kuba ziye zakhula zilandelelana ukuqala kwezo zityalwe kuqala ukuya kwezo sezivuthiwe, amatyholo nemithi egqibelelelyo.

Imihlaba ibonise utshintsho oluhamba nolunye ngakwithambeka, ngokonyuka okuncomekayo kwi-organic carbon, initrojeni epheleleyo kunye neemolekhule ezininzi, ngokunjalo notshintsho lwamandla eemoletyhule. Oku kokugqibela kunxulunyaniswa ngokusondeleyo ne-organic carbon, leyo kule mihlaba iyintlabathi isebenza njengomxube wamasuntswana endaweni yodongwe.

Izincomo

Kuthathelwa ingqalelo ukuzinza okukhawulezayo kwenkqubo yeengqumba zentlabathi ezinqamlezileyo e-Koeberg, kwenziwa isincomo sokuba kwenziwe okuninzi kwindawo yesibonelelo esitsha seNyukliya kwiingqumba zentlabathi ezinqamlezileyo ngqo kumntla we-NPS esele ikhona. Nakuba kunjalo, oku kufuneka kukhatshwe ngamanyathelo angqongqo aqinisekisa ukusetyenziswa ngononophelo okufanelekileyo komlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni, ukwakhiwa kwesithinteli phakathi kweengqumba zentlabathi eziphuhliswayo kunye nezo zikhoyo ngoku, kunye nokuphunyezwa kesicwangciso solawulo esisebenzayo ngexa lazo zozibini izigaba esokwakha kunye nesokusebenza. Esi sicwangciso sinokuquka, phakathi kokunye, ukubuyisela kwisimo sangaphambili okusebenzayo kunye nohlolo, kunye nokuphakanyiswa kweNdawo yoLondolozo Ndalo yase-Koeberg ngokongezwa komhlaba kumantla.

1.11 Imigxobhozo (Appendix E12)

Intshayelelo

Injongo yeli candelo kukubonelela ngesishwankathelo esifutshane seengxaki ezingamandla zokuphuhliswa kweSikhululo saMandla seNyukliya (NPS) esicetywayo kwimigxobhozo yeziza ezithathu ngokutshintshatshintshana – iDuynefontein, iBantamsklip neThyspunt. Zonke iziza ngokutshintshatshintshana, ziquka kwimida yazo neendawo ezikufuphi ezizingqongileyo, iinkqubo zemigxobhozo ezibaluleke kakhulu kwizinto eziphilayo nendawo zazo zokuphila ezingenazo iimpembelelo xa kuthelekiswa yaye ezicingelwa ukuba zinokuba ziintsalela zokugqibela (kwimeko yaseDuynefontein) zamakhaya endalo ezilwanyana nezityalo ezikhethekileyo emigxobhozweni elahlekileyo kwimimandla emikhulu okanye, kwimeko yaseBantamsklip yaye ngokukodwa eThyspunt, kucingwa ukuba ziinkqubo ezizodwa ezingakhangeleki ngathi zinokumelwa kwimo yazo yangoku nobumbaxa kuyo nayiphi enye indawo ehlabathini. Imo yolondolozo kuzo zozithathu iziza, ngokwembono yemigxobhozo, iphezulu ngokugqithisileyo yaye naziphi izothuso kwimfezeko yazo, zibonwa zingalunganga ngokuqapheleka okuphezulu.

Ingxelo esisekelwe phezu kwayo esi sishwakathelo ithathele ingqalelo iziphumo zonyaka wokuhlola nokuhlalutya okunzulu kwamanzi omhlaba namanzi angaphezu komhlaba (Visser *et al*. 2011), ezidale amazinga aphezulu entembeko anikelwe iingqikelelo

zeempembelelo zemisebenzi ecetywayo eyanyaniswa nophuhliso lweNPS, kwimigxobhozo yesiza ngasinye sezithathu ezikhankanywayo. Ezinye zezigqibo zale ngxelo, ngako oko zitshintshe kakhulu kwezo bezibonisiwe kwiingxelo zangaphambili (umz. Day 2009 and 2010).

Iimpembelelo ezayanyaniswa neNPS ecetywayo

Iimpembelelo ezinxulumene nophuhliso olucetywayo lweNPS kwimigxobhozo zahlukahluke kakhulu phakathi kweziza ngokutshintshatshintshanayo, ngokuxhomekeke kukusondela kwesiza ngasinye kwimigxobhozo, kwakunye nokusebenzisana kwamanzi omhlaba / angaphezu komhlaba kwiziza ngokunqamlezayo. Iimpemelelo ezingamandla ezivavanyiweyo zishwankathelwe ngezantsi.

EDuynefontein

Iimpembelelo ezingamandla ezayanyaniswa nophuhliso lwesigaba esinye seNPS kwesi siza, ziquka ukukwazi ukuthoba okanye ukuphazamisa okuphantsi kwemigxobhozo eyenziweyo engeyiyo eyendalo kumntla-ntshona wesiza, imigxobhozo yendunduma ezehlelayo ezidlulayo zeendunduma ezishenxayo nemigxobhozo enokubakho ehlukaniswa ngamaxesha athile kufuphi nendlela ecetywayo yokungena. Ummandla wophuhliso “onconywayo” (okanye onolona vakalelo luphantsi) womatshini ocetywayo, ukude ngokwaneleyo kwimigxobhozo enolona vakalelo lukhulu kwisiza – oko kukuthi, imigxobhozo yendunduma ehlelayo ethe gongqo phantsi kwinxalenye ekumzantsi-ntshona wesiza. Umfuziselo wamanzi omhlaba unxulumana nezinga eliphantsi lokutsalelwa ezantsi kuyo yomibini, kwakunye neminye imigxobhozo kwisiza, ngenxa yokufunxeka kwamanzi.

Ngaphandle kokuzalisekisa amanyathelo okunciphisa, iingxaki zophuhliso lweNPS enye eDuynefontein zivavanywe ngokuba nokubaluleka okungalunganga okuphakathi ngokwembono yomgxobhozo.

EBantamsklip

Ummandla wophuhliso “onconywayo” (okanye onolona vakalelo luncinci) we-EIA ecetywayo neepaseji zeHV kwesi siza, ukumazantsi endlela iR43 ecanda phakathi kwesiza. Indlelangokwayo isebenza njengesithintelo kwinxalenye esemantla yesiza, apho kukho umlambo obaluleke kakhulu iGroot Hagelkraal River nemitsitso yethambeka eyayanyaniswa nawo kwakunye namasebe awo omgxobhozo okumanzantsi entlambo. Inkolelo engamandla yovavanyo lwe-EIA kwesi siza yeyokuba imisebenzi eyayanyaniswa nezigaba zokwakha nezokusebenza kweNPS, iya kuphelela kummandla okumzantsi wendlela iR43. Oku kuthetha ukuba, iimpembelelo kwiinkqubo zemigxobhozo ezivela kwiprojekthi ecetywayo ziya kuphetshwa kakhulu. Imimandla engamandla exhalabisayo yelandelayo:

- Ukwanda kokusetyenziswa kwendlela iR43, okukhokelela ekuqhekekeni kweepaseji zomgxobhozo
- Ukuthotywa okunokwenzeka kwemo yomgxobhozo ngokuxhomekeke kwindawo ekwakhiwe kuyo izakhiwo zolawulo zeNPS
- Iziphumo ezingalindelekanga ezinokwenzeka zokwanda kophuhliso kummandla wePearly Beach.

Kwezi, uvavanyo lomba wokugqibela ungaphandle komda wolu phononongo. Nangona kunjalo umba ubonakala ufuna ukuqwalaselwa.

Uphononongo lokuhamba kwamanzi omhlaba (geohydrological) (Visser et al. 2011) lubonise ukuba nangona iradiyasi yokutsalela ezantsi eyanyaniswa nokufunxeka kwamanzi kwesi siza inokolulwa ukuya kufuphi neenkqubo zemilambo iGroot Hagelkraal neKoks River, nangona kunjalo akukhangeleki ngokungathi naziphi na ziya kuchaphazeleka.

Ngaphandle kokufezekisa nawaphi amanyathelo okunciphisa, iingxaki ezongezelelekayo zophuhliso lweNPS enye eBantamsklip, zivavanywe ngokuba nokubaluleka okungalunganga okuphakathi ngokwembono yomgxobhozo.

E**Thyspunt**

Uphuhliso kwesi siza, xa engekho amanyathelo okunciphisa, lungayanyaniswa nezona mpembelelo zininzi, ezinzulu nezimbaxa kwiinkqubo ezibalulekileyo zomgxobhozo. Iimpembelelo ezingamandla ezivavanyiweyo ziquka:

- Ukulahleka nokuthotywa ngokusisigxina kwemitsitso yemigxobhozo eselunxwemeni ngenxa yokufunxeka kwamanzi / ukuphambuka kwamanzi omhlaba, ukuyondelelanisa ukumpompoza kwamanzi omhlaba kwakunye neendlela ezintsha ezicetywayo;
- Ezinye iingozi zeempembelelo eLangefonteinvlei ngenxa yeziphumo zokutsaleleka ezantsi okunokwenzeka: nangona kunjalo, ukubakho kwengozi kucingelwa kuphantsi, ngokwezinto ezifunyaniswe nguVisser *et al*. (2011), ezokuba iLangefonteinvlei ihleli phezu kwetafile yamanzi omhlaba kwimida esemanzantsi nesentshona. Ngako oko, iimpembelelo zokutsaleleka ezantsi kungafuneka zinabele kwiinxalenye ezisemantla nasempuma phambi kokuba zibe neziphumo ekuhambeni kwamanzi omhlaba omgxobhozo;
- Isiphazamiso sokuqhekeka, ukuzalisa nembonakalo kwimigxobhozo yeendunduma ezehlelayo kwinkqubo yeendunduma ezishenxayo eOyster Bay nakwimigxobhozo ekufuphi nomntla wommandla weendunduma waseOyster Bay, ngenxa yeempembelelo ezayanyaniswa nezinto ezicetywayo ezifana nepaseji yeentambo zothumelo, iindlela nezinto ezinokukhethwa zokuthutha iintsalela ukunqamleza iindunduma;
- Ukuzalisa nokuqhekeka okunokwenzeka kwimigxobhozo ebalulekileyo kumazantsi entlambo ngenjongo yokuvumela ukwakhiwa kweendlela zokufikelela kwisiza kwakunye nokufaka phantsi komhlaba imibhobho yamanzi;
- Ukuthotywa kwemigxobhozo ethe gongxo emhlabeni neminye ngenxa yokuthutha izinto ezingafunwayo ezigqithisileyo phezu kweendunduma ukuya kwiplatfomu yeHVY.

Iimpembelelo ezingentla kunokwenzeka zibe neziphumo ezibonakalayo zokuthoba inkqubo ekhoyo ngoku yomhlaba ongenazo iimpembelelo nemigxobhozo elikhaya lendalo lezilwanyana nezityalo, ezinamazinga aphakamileyo othungelwano nexabiso eliphakamileyo lokwahlukahlukana kwezinto eziphilayo, zinto ezo iinkqubo zomgxobhozo ezenza igalelo elibalulekileyo kuzo. Iimpembelelo ezongezekayo zophuhliso olucetywayo lweNPS enye kwisiza saseThyspunt ngaphandle kwamanyathelo okunciphisa, zivavanywe zinokubaluleka okuphezulu okungalunganga.

Amanyathelo onciphiso angundoqo andululwayo kwisiza ngasinye

EDuynefontein

Unciphiso lokuphepha iimpembelelo kwimigxobhozo kucingwa ukuba kunokwenzeka kwesi siza. Amanyathelo onciphiso ajolise kulawulo olunesiphumo longcoliseko luthuli, amanzi ezikhukhula neenkqubo zokwakhiwa kwendlela, nokumiswa kweNPS nezibonelelo zayo zokusebenza kwimimandla enolona vakalelo luncinci kwiindawo zophuhliso. Phakathi kweepaseji ze-EIA neHV, ukugcinwa kweendunduma ezishenxayo njengenkqubo eqhubekayo kuyanconywa, ukuqinisekisa ulondolozo lwemisebenzi yomgxobhozo phakathi nakumntla weendunduma. Imigxobhozo ekwisiza saseDuynefontein engaphandle "kommandla wophuhliso okhuthazwayo," esecaleni kwemida yaso yomhlaba neepaseji ezithungelanayo, ichongwe njengemimandla "engeyiyo yophuhliso".

EBantamsklip

Amanyathelo onciphiso afunekayo kwesi siza angafuna:

- Ulawulo lwesiza kumantla eR43 njengommandla wolondolozo lwendalo, ngomgaqo wolondolozo lwendalo lwexesha elide lwesiza (emva kwexesha lobukho beNPS)

Ngaphezu koko, ingxelo iqaphelise ukunqweneleka:

- Kokukhuliswa kweekholveti ezinqamleza phantsi kweR43 eGroot Hagelkraal
- Kokubambelela kwizithintelo ezithile zophuhliso ePearly Beach.

Ezi zincomo zichaphazela imimandla engaphandle kolawulo ngqo lukaEskom yaye ngako oko azinako ukuba yimiqathango yogunyaziso.

Impembelelo eyongezelekayo yeNPS kwesi siza, ngonciphiso, inokuba yimpembelelo elungileyo yokubaluleka okuphezulu, ngokusekelwe kwithuba eliqukwe kuphuhliso lokufumana ulondolozo lwendalo lwexesha elide lweenkqubo zomgxobhozo kumntla weR43.

EThyspunt

Amanyathelo afunekayo onciphiso kwesi siza angaquka okulandelayo:

- Ukuqonda iintlobontlobo "zeendawo okungangenwa kuzo" zemimandla yophuhliso nezinto ezibuyisela emva izinto eziphilayo neendawo zazo zokuhlala – ukuzalisekisa umba wokugqibela, kungafuna ukuba "ummandla wophuhliso onconywayo" ocetywayo kwisiza ubekwe ukuya ngasentshona, ukulungiselela umhlaba onconywayo osisidambisi eLangefonteinvlei;
- Ulawulo lwesiza sonke, ngaphandle kobukho beNPS phakathi kommandla "onconywayo" wophuhliso njengommandla osesikweni wolondolozo lwendalo;
- Ukuthenga yonke imihlaba ekunokwenzeka inqamleze indlela yokufilelela esempuma ngasempuma kwesiza saseThyspunt ukuya kuma kumda wasentshona

weThe Links, nolawulo lwemimandla yeendunduma nemigxobhozo ethengiweyo ngaloo ndlela njengommandla obekelwe bucala ulondolozo lwendalo.

Unciphiso oluchasene nengozi yokutsalelwa phantsi kwamanzi okunxulumene neempembelelo eLangefonteinvlei luquka ukufakelelwa kweendonga zokuthintela, amalaphu angangenwa lula lulwelo okanye ezinye izixhobo ezifanelekileyo zokunciphisa ukufunxeka kwamanzi eziyilwe ngendlela yokuthintela ngokukuko, ukutsaleka kwamanzi kwiradiyasi yokombiwa kwesiza seNPS ngokwaso, nokuthintela nayiphi ingozi yeempembelelo zokutsaleka kwamanzi echaphazela iLangefonteinvlei.

Amanyathelo okunciphisa achasene neempembelelo zemitsitso elunxwemeni azinze ekuqukeni iindlela zokuyila ukungafunxeki kwamanzi, eziya kuvumela ukusasazwa kwakhona kwexesha elide nokuphambukisa usasazeko / ukufunxeka kwamanzi omhlaba ukuphinda kwisinyibilikisi, ukuze sigalele kwimitsitso yaselunxwemeni eyehla nomlambo, kuthathelwa ingqalelo ukwanda okuqikelelwayo kokuphakama kolwandle okunokwenzeka ngenxa yokuba netyuwa kwamanzi omhlaba ngaphezulu nje kokuphakama kolwandle kwangoku.

Amanye amanyathelo akhuthazwayo okunciphisa kwesi siza angaquka:

- Indlela yokungena esemantla kufuneka ingasetyenziswa, yaye indlela yokungena yasentshona kufuneka ilungelelaniswe ngokutsha ukuya emantla ngenjongo yokuphepha inani lemitsitso elunxwemeni;
- Iindlela zokungena kufuneka zenzelwe iibrorho zokuwela imigxobhozo ewelwa ngokungenakuphetshwa ziindlela;
- Iingcingo zothumelo kufuneka ziquke naziphi iindlela zokulondoloza / zokungena ukunqamleza iindunduma ezishenxayo, yaye kufuneka kwenziwe isibonelelo sokufikela ngehelikopta okanye (ukuba kunokwenzeka) ngesithuthuthu esinamvili amane kuphela;
- Unciphiso lweempembelelo ezayanyaniswa nothutho lwentlabathi ukunqamleza iindunduma ezishenxayo lunokwenzeka, ukuba kunokusetyenziswa inkqubo yokuhambisa, kodwa kubekwe izithintelo eziphathekayo kulwakhiwo / ulondolozo lweendlela nolawulo lwentlenga.

Nangona kunokuzalisekiswa onke amanyathelo onciphiso achaziweyo ngentla, isiphumo esongezelelekayo sisathathwa sisesokubaluleka okuphezulu okungalunganga okukhoyo, ngenxa yempembelelo yentsalela kwimigxobhozo emikhulu engachatshazelwanga yimpembelelo ngoku kunqamleza ummandla omkhulu, nokuthotywa okukhoyo nokungenakuncitshiswa kommandla omncinci wemigxobhozo yomtsitso oselunxwemeni ongachatshazelwang ziimpembelelo.

Nangona kunjalo unciphiso lokulinganisa lunokwenzeka, yaye lungaquka imimandla yolondolozo lwendalo equka imigxobhozo yeEastern Valley Bottom neyemimandla yeendunduma yaseOyster Bay ngokwayo, ukuya kummandla onempembelelo kumntla womda webala legalufa laseThe Links. Inyathelo elifunekayo lithatha ukuba kuthengwe yonke imihlaba esecaleni kwendlela yokungena yasempuma ecetywayo phambi kokuba iphuhliswe, yaye ngaloo ndlela kuthengwe umhlaba omkhulu womgxobhozo nenkqubo yeendunduma, ezo ngenye indlela ziya kuba neempembelelo zophuhliso ngokusisigxina (kodwa zingatshatyalaliswa). Oku akunciphisi ngokuchasene nelahleko yemitsitso yemigxobhozo yaselunxwemeni, kodwa kunika ithuba lolawulo olukhulu nolondolozo

lweenkqubo zokuphila zomgxobhozo zizonke yaye kukholelwa ukuba zilinganisa ilahleko yeminye yale migxobhozo ebalulekileyo, xeshikweni kugcina imigxobhozo yaseLangefonteinvlei neendunduma ezehlayo zikwimeko engenayo impembelelo. Kwimeko yokuba amanyathelo onciphiso olupheleleyo nolinganiso azalisekisiwe, impembelelo eshiyekileyo kwimigxobhozo kwisiza saseThyspunt kungenza kube yeyokubaluleka okulungileyo, nomboniso okhethekayo kwenye indlela evavanyiweyo yokungabikho kophuhliso.

Xa kuthethiwe oku, nangona kunjalo, kuyavunywa ukuba ngokuthandekayo, akukho nomnye wemigxobhozo engaphakathi neyanyaniswa nendunduma yaseOyster Bay, ekufuneka ibeyinxalenye yolungiso naluphi lophuhliso. Kwimeko yokuba beyingekho enye indlela efumanekayo yophuhliso ebonelela ngamathuba enkxaso-mali aneleyo okulawula izinto ezingezizo zelizwe, yaye kungaquki ukwaphuka ngeziqendwana kommandla ukuba ngamasuntswana amancinci ophuhliso, ngako oko ukhetho olunjalo belunokuthandeka ngokucacileyo ngokwembono yezinto eziphilayo neendawo zazo zokuhlala, kulo naluphi uphuhliso lwesibonelelo samandla enyukliya kwesi siza.

1.12 Lezilwanyana Zelizwe (Appendix E13)

EDuynefontein, ubungakanani bomhlaba wophuhliso ofumanekayo, nongenalo uvakalelo oluphezulu kwizilo zonke zelizwe, unqongophele kodwa wanele ukuvumela iNyukliya-1. Nangona kunjalo, ukwandisa okongezelelweyo kwixa elizayo kwamalungiselelo okuvelisa amandla phakathi kwepropati yangoku kaEskom, ukuya kumantla eKNPS, kufuneka kungacingwa.

Uphuhliso lweNyukliya-1 eDuynefontein lunokuba neempembelelo ezimbi ezibalulekileyo, ikakhulu ngenxa yeempembelelo ezithe ngqo kwikhaya lendalo lezilwanyana zelizwe ezikhoyo phakathi kwemimandla. IDuynefontein ingazuza kukhetho lokungaphuhlisi ngenxa yokuba umhlaba sele ulawulwa njengenxalenye yolondolozo lwendalo yabucala. Amathuba emilinganiso yolondolozo kwisiza anqongophele.

EBantamsklip, kwicala laselunxwemeni lwe-R43, ubungakanani bomhlaba wophuhliso ofumanekayo nongenalo uvakalelo oluphezulu kwizilo zonke zelizwe, wanele ngokugqithiseleyo ukuvumela iNyukliya-1. Inxalenye yepropati engaphakathi kwelizwe ku-R43 inovakalelo oluphezulu yaye kufuneka ingaphuhliswa kwaphela.

Uphuhliso lweNyukliya-1 eBantamsklip lunokuba neempembelelo ezimbi ezibalulekileyo, ikakhulu ngenxa yeempembelelo ezithe ngqo kwikhaya lendalo lezilwanyana zelizwe ezikhoyo phakathi kwemimandla. Nangona kunjalo, imilinganiso ebalulekileyo enokubakho inokwenzeka eBantamsklip ukuba indawo engaphuhliswanga inokubhengezwa njengendawo yolondolozo lwendalo ize ilawulwe ngokuneziphumo. Oku kungaxhomekeka ngokukodwa kukhuseleko nolawulo lwenxalenye engaphakathi kwelizwe, kwakunye nepaseji eyaneleyo yaselunxwemeni.

Ukhetho lokungaphuhlisi iBantamsklip alulunganga ngenxa yokuba kungacingelwa ukuba kuya kukhokelela kutshintsho lobunini-mhlaba yaye mhlawumbi uphuhliso elunxwemeni lweendawo zokuhlala kunye/okanye ezokuthatha ikhefu, nokwanda okunokwenzeka kobunzulu bemizamo yokusebenzela indyebo yelizwe ngezolimo kwinxalenye engaphakathi kwelizwe.

Ubungakanani bomhlaba wophuhliso ofumanekayo, yaye lowo ungenalo uvakalelo oluphezulu kwizilo zelizwe, uthinteleke kakhulu yaye awanelanga ukuvumela iNukliya-1. Nangona kunjalo, ukuba umhlaba owongezelelweyo ubunokuthengwa owayamene nomhlaba omnxinwa odibana nomhlaba obanzi kwinxalenye yepropati, oku kusilela bekungoyiswa.

Uphuhliso lweNyukliya-1 eThyspunt lunokuba neempembelelo ezimbi ezibalulekileyo, ikakhulu ngenxa (a) yeempembelelo ngqo kwindawo yokuhlala yezilwanyana zelizwe ezikhoyo phakathi kwemimandla, (b) yophuhliso lweendlela ezintathu ezinkulu ezintsha zofikelelo, kunye (c) nemfuneko yokuphuhlisa ipaseji ukucanda ummandla omkhulu weenduli ezishenxayo, ezenza esi siza sibe yingxaki enkulu ngokuphathelele izilwanyana zelizwe neendawo zazo zokuhlala. Kwelinye icala, imilinganiso ebaluleke kakhulu enokubakho inokwenzeka eThyspunt ukuba umhlaba ongaphuhliswanga ungabhengezwa njengendawo yolondolozo lwendalo uze ulawulwe ngokuneziphumo. Imilinganiso enjalo inokomelezwa kakhulu ngokuthengwa komhlaba owongezelelweyo.

Ukhetho lokungaphuhlisi iThyspunt akulunganga ngenxa yokuba kuthathwa ngokuthi kuya kukhokelela kutshintsho lobunini-mhlaba yaye mhlawumbi kuphuhliso elunxwemeni lweendawo zokuhlala kunye/ okanye ezokuthatha ikhefu, yaye mhlawumbi nokwanda kubunzulu bemizamo yokusebenzela indyebo yelizwe ngezolimo kwinxenye engaphakathi kwelizwe.

Imeko ebalulekileyo engalunganga kukusilela kolwazi olucacileyo nokuba izicombululo zobunjineli ezaneleyo ziyafumaneka ukuphepha iimpembelelo ezimbi kakhulu ekumpompozeni kwamanzi omhlaba nemigxobhozo enovakalelo yaseThyspunt. Kukho iimfuno ezifanayo zolwazi olongezelelweyo ngamandla eenguqu kummandla weenduli ezishenxayo, nokubhala ngcono iimaphu zamahlathi namatyholo eenduli zezityalo zamanye amazwe. Kuyafuneka ukuba amaphononongo afunekayo aqhutywe ngokungxamisekileyo ukwazisa inkqubo yeEIA.

Ngokwembono yolondolozo lwekhaya lendalo lwezilwanyana nezityalo, izigqibo eziqukayo ezilandelayo zifikelelwe:

- Ngokwemeko yangoku yokungaqiniseki malunga namanzi omhlaba nemigxobhozo kwakunye neminye imiba yezinto eziphilayo kokusingqongileyo, nokunganeli kobungakanani bomhlaba ofanelekileyo wophuhliso, isindululo sophuhliso eThyspunt sineziphene okwangoku. Kufuneka le meko iphuculwe ngokugqibezela amaphononongo achanekileyo, nokufumana umhlaba owongezelelekileyo, xa kukho imfuneko.
- Imicimbi engekenziwa eThyspunt kufuneka iconjululwe ngokwanelisayo phambi kokuba kwenziwe izigqibo zokugqibela yaye ngexesha lokuba amanyathelo okunciphisa afunekayo abalulwe ngokupheleleyo. Oku kunokuba nesiphumo sokumisela uphuhliso lwaseThyspunt elinye ixesha.
- INyukliya-1 ingaphuhliswa nokuba kuseDuynefontein okanye eBantamsklip, ngaphandle kwamaphando angezelelweyo eEIA yamakhaya endalo ezilwanyana nezityalo.

Iimpembelelo ezichongiweyo zeziza ezintathu ziyafana ngokutshintshisanayo, eDuynefontein, eBantamsklip naseThyspunt, nangona ubukhali beempembelelo bahlukile kwisiza nesiza. Nazi iimpembelelo ezichongiweyo:

i. Ukutshabalalisa amakhaya endalo ezilwanyana nezityalo nabemi bawo
ii. Ukunciphisa abemi beentlobo eziseNgozini
iii. Ukuqhekeka kwamakhaya endalo ezilwanyana nezityalo kunye neendlela zokuhamba kwezilwanyana
iv. Ukufa ezindleleni
v. Ukufa okwayanyaniswa neentambo zothumelo ezihamba phezulu kunye nezikhululo ezinganeno
vi. Uphazamiso lwabemi abafuyayo abanovakalelo
vii. Ungcoliseko lothuli ngaphaya kwesiza sokwakha
viii. Ungcoliseko lomhlaba namanzi ngaphaya kwesiza sokwakha
ix. Ungcoliseko lokukhanya ngaphaya kwesiza sokwakha
x. Utshintsho lwemiphakamo nemimpompozo yamanzi omphezulu nawomhlaba, neziphumo kwimigxobhozo yengingqi
xi. Ukuzingela ngaphandle kwemvume izilwanyana zasendle zengingqi
xii. Ukufanekisa ngemidlalo iingxaki zezilwanyana
xiii. Ukuqokelelana kweeradioisotope (ilungu leradio elahluke kwelinye ngobunzima nenukliya kodwa hayi ngeempawu zekhemistri) kokusingqongileyo nakwimizimba yezilwanyana zasendle
xiv. Iimpembelelo ezongezelekayo
xv. Imo ephucukileyo yolondolozo yomhlaba ongaphuhliswanga (impembelelo elungileyo).

Amanyathelo okunciphisa akhuthazwayo ayafana kwiziza ezintathu ngokutshintshisanayo, eDuynefontein, eBantamsklip naseThyspunt, nangona iinkcukacha zahlukile kwisiza nesiza.

i. Unciphiso lokutshabalalisa amakhaya endalo ezilwanyana nezityalo nabemi bawo

- Uphuhliso maluphelele kwindawo ekhoyo ekhuthazwayo.
- Ubukho bophuhliso mabuphelele kweyona ndawo incinci kangangoko.
- Ukulahla umonakalo elwandle
- Yila imimandla yokubekela kwiindawo ebeziphazamisekileyo ngaphambili.
- Ukusebenzisa iimbonakalo zendalo zokwakheka komhlaba njengemida.
- Ukucoca isiza ngolandelelwano olunengqiqo.
- Ukuphawula imimandla echaphazelekayo.
- Ukubuyisela kwimo yangaphambili imimandla echaphazelekileyo, apho kunokwenzeka.
- Ukwenza imbuyekezo yelahleko yamakhaya endalo ezilwanyana nezityalo. (Jonga ngezantsi.)

ii. Unciphiso lokuphungula abemi beentlobo eziseNgozini

- Onke amanciphiso adweliswe ngaphantsi kwe-(i) (ngentla).
- Ukulungiselela imisebenzi yokufuna nokuhlangula ngaphambi nangexesha lokucoca isiza.
- Ukulungiselela ukuqokelela izinto nolwazi lwezenzululwazi ngaphambi nangexesha lokucoca isiza.

iii. Unciphiso lokuqhekeka kwamakhaya endalo ezilwanyana nezityalo neendlela zokuhamba kweezilwanyana

- Uninzi lwezinciphiso ezidwelisiweyo ngaphantsi kwe-(i) (ngentla).
- Ukwenza isibonelelo seepaseji zezinto eziphilayo namakhaya azo.
- Ukwakha iinkalo zokuwela ngaphantsi nangaphezulu kweendlela.
- Ukwenza iindlela zibe kude kangangoko kwimigxobhozo.
- Ukusebenzisa iintlobo ezikhuthazwayo zokubiyela ngokhuseleko.
- Naphi apho kunokwenzeka, Ukubeka uluhlu lwemibhobho neentambo ngaphantsi komhlaba, yaye ubuyisele umhlaba kwimo yesiqhelo.
- Ukunciphisa inani leendlela neziporo yaye uzibeke ngononophelo.
- Ukwenza ukuba iindlela zingafikeleleki ngamaxesha amisiweyo yonke imihla.

iv. Ukunciphisa ukufa ezindleleni

- Ukunciphisa inani leendlela neziporo yaye uzibeke ngononophelo.
- Uwenza iindlela zibe kude kangangoko kwimigxobhozo.
- Ukwakha iinkalo zokuwela ngaphantsi nangaphezulu kweendlela.
- Ukuthintela isantya ezindleleni.
- Ukwenza ukuba iindlela zingafikeleleki ngamaxesha amisiweyo yonke imihla.
- Ukubeka iimpawu zokulumkisa kwiindawo ezifanelekileyo.
- Ukusebenzisa izilawuli zesantya eziyilwe ngokufanelekileyo.

v. Ukunciphisa ukufa okuyamaniswa neentambo zothumelo ezihamba phezulu kunye nezikhululo ezinganeno

- Ukufakela izixhobo ezisemgangathweni kuzo zonke iindlela ezintsha (umz., “iziphekuzi” okanye izibuyisi zokukhanya okanye “iibhola”).
- Ukuhlola iindlela nezifakelo.

vi. Ukunciphisa uphazamiso lwabemi abafuyayo abanovakalelo

- Qinisekisa indawo nobungakanani beentaka ezinovakalelo kunye neminye imimandla.
- Valela bucala iintaka ezinovakalelo kunye neminye imimandla.
- Thintela amaxesha okudubula.
- Dala imimandla yemida ebanzi.
- Thintela isiphithiphithi seenqwelomoya.
- Thintela ukuhanjiswa kwamanzi.
- Nyanzelisa zonke izithintelo.
- Misa indlela yokuhlola.

vii. Ukunciphisa ungcoliseko lothuli ngaphaya kwesiza sokwakha

- Sebenzisa amanyathelo okunciphisa asemgangathweni, umz., ukumanzisa ngamanzi amatsha, ukusebenzisa izibiyeli zokuthintela zelaphu okanye ezamatyholo, ukugquma iingqumba ngeeplastiki ezithe tyaba, njl.
- Musa ukusebenzisa amanzi olwandle.

viii. Ukunciphisa ungcoliseko lomhlaba namanzi ngaphaya kwesiza sokwakha

- Sebenzisa amanyathelo okunciphisa asemgangathweni.
- Susa kwisiza wonke umhlaba namanzi angcolisekileyo.
- Lahlela elwandle amanzi anetyuwa avela ekususeni ityuwa.
- Lahla amanzi amdaka edolophu ngendlela elondolozayo.

ix. Ukunciphisa ungcoliseko lokukhanya ngaphaya kwesiza sokwakha

- Nciphisa izibane zangaphandle.
- Sebenzisa izibane zobude bamaza amade kuphela.
- Sebenzisa izifakelelo zokwalatha imbombo.
- Yenza ikhuse kwizibane zangaphakathi.

x. **Ukunciphisa inguqu yemiphakamo nemimpompozo yamanzi omphezulu nawomhlaba, neziphumo ezongezelelekayo kwimigxobhozo yengingqi**

- Phepha iziza apho umonakalo omkhulu kumgxobhozo ungenakunqandwa.
- Musa ukusebenzisa imigxobhozo okanye amanzi omhlaba njengemithombo yamanzi amatsha.
- Lawula njengenjineli izisombululo zokumpompoza kwamanzi omhlaba.
- Qhuba amaphononongo awongezelelweyo eThyspunt.

xi. Ukunciphisa ukuzingela ngaphandle kwemvume izilwanyana zasendle zengingqi

- Fundisa abasebenzi.
- Gada ummandla.
- Lawula izinto zokusebenza.
- Lawula izixhobo zokudubula.
- Lawula ufikelelo emva kweeyure zomsebenzi.
- Lawula ufikelelo kwimimandla engeyiyo yokwakha.

xii. Ukunciphisa iingxaki zezilwanyana ngokufanekisa ngemidlalo

- Musa ukuvumela ukutyiswa kweezilwanyana zasendle.
- Gcina imithombo yoncedo enomtsalane apho ingenakufikelelwa.
- Sebenzisa ulawulo olungqongqo lwenkukuma etyekayo.
- Shenxisa iikati nezinja zasendle.
- Musa ukuvumela izilo-qabane kwisiza.

xiii. Ukunciphisa ukuqokelelana kwee-radioisotope (ilungu leradio elahluke kwelinye ngobunzima nenukliya kodwa hayi ngeempawu zekhemistri) kokusingqongileyo nakwimizimba yezilwanyana zasendle.

- Akukho zinciphiso zikhuthazwayo, ngaphaya kwezo zifunwa ngokwempilo yoluntu nemithetho yokhuseleko.

xiv. Ukunciphisa iimpembelelo ezongezelekayo

Izinciphiso ezikhuthazwayo eziya kuba nelona galelo likhulu zezi:

- Ukhetho lwento ekhoyo yophuhliso olufanelekileyo
- Ukubuyisela kwimo yesiqhelo imimandla eyonakalisiweyo, emva kokwakha
- Ukusebenzisa uyilo olufanelekileyo lokubiyela umda
- Ukusebenzisa ukukhanya okufanelekileyo ngaphandle
- Ukuphepha nokunciphisa iimpembelelo kumanzi omhlaba
- Ukunyanzelisa izithintelo zeziphazamiso nokuzingela ngaphandle kwemvume izilwanyana zasendle
- Ukuhlola abemi abanovakalelo ukunceda ulawulo lokusingqongileyo
- Ukuhlola ungcoliseko lweradioisotope ukunceda ulawulo lokusingqongileyo.

xv. Ukunciphisa/ ukubuyekeza iimpembelelo ngokuphucula ulondolozo lomhlaba ongaphuhliswanga

- Ukuphakamisa imo yezomthetho yeenxalenye ezingaphuhliswanga ukuba ziindawo zolondolozo lwendalo ngokusemthethweni
- Ukwenza ukuba izibiyeli ezingafanelekanga zocingo lomnatha zithathelwe iindawo zizibiyeli zeepali zentsimbi
- Iindleko ezandileyo zokususa izityalo zelinye ilizwe ezihlaselayo
- Ukufakela iinkalo ezimbini okanye ezintathu ezihamba ngaphantsi ezibekwe ngobuchule ukulungiselela ukuhamba kwezilwanyana ukuwela iindlela eziphithizelayo
- Ukugunyazisa amaphando anzulu amaqela ezilwanyana eziphandwe ngokusilelayo, ezi zezi., izirhubuluzi, izilwanyana eziphila emhlabeni nasemanzini nezilwanyana ezanyisayo ezincinci

Ukugunyazisa inkqubo yokuhlola abemi beentlobo ezinovakalelo

Inkqubo ekhuthazwayo yokuhlola nokuxabisa

Inkqubo efanelekileyo yokuhlola nokuphicotha kufuneka yenziwe ukulandela umkhondo wokusebenza ngempumelelo kwamanyathelo okunciphisa. Ubuninzi boku kuhlola kufuneka bakhelwe kwinkqubo yokuphicotha yeeEMP yezigaba zokwakha, ukusebenza nokuphelisa ugunyaziso, kodwa ufakelo ngexesha lesigaba sokuyila nako kananjalo kubalulekile ekwenzeni imida yemimandla enovakalelo. Inkqubo kufuneka iquke uhlolo olubhekiswe ngqo ngokukhethekileyo kubemi bezilo zonke zelizwe ezinovakalelo.

1.13 UHlolo lweziLwanyana ezingenaMqolo zoMmandla oThile (Appendix E14)

Ngexa lwamaphando amabini angaphandle ka-Agasti–Septemba 2012 kunye noDisemba 2013, ama-605 eentlobo zezilwanyana ezingenamqolo zaqokelelwa kwindawo ezingama-51 zokuthatha iisampuli e-Duynefontein, Bantamsklip nase-Thyspunt. Kwezi ntlobo zezilwanyana zingama-605, iintlobo zezilwanyana ezili-138 zifunyenwe e-Duynefontein kuphela, iintlobo zezilwanyana ezingama-205 zafunyanwa kuphela e-Bantamsklip kwaze iintlobo zezilwanyana ezili-166 kwathathwa iisampuli zazo e-Thyspunt. Iintlobo zezilwanyana ezingamashumi amabini anesixhenxe zafunyanwa kuphela kummandla oseNtshona ye-Strandveld (kuqukwa i-Duynefontein ne-Bantamsklip kuphela), kunye neentlobo zezityalo ezingama-69 ze-eurytopic (usasazo

lwejografi olubanzi) kwathathwa iisampuli zazo. Izilwanyana ezingenamiqolo ezifunyenweyo ngexa lwamaphando amabini angaphandle ziquke iinkumba, iinkume, izilwanyana ezincinane zaselwandle, amakhalane, oonomadudwane, izigcawu kunye nezinambuzane. Uninzi lwezi ntlobo zezilwanyana luchongelwe kakhulu kwinqanaba losapho; iintlobo zezilwanyana ezili-133 zichongelwe kwinqanaba leqela okanye lweentlobo.

ISigcawu se-Wishbone Trapdoor se-genus *Spiroctenus* Simon, 1889 saye sathathwa kwisiza sase-Bantamsklip kuphando lwangaphandle lukaDisemba 2013. Uluhlu oluhle kakhulu lwezilwanyana zovavanyo eziphilayo lwaye lwathunyelwa kwingcali u-Ian Engelbrecht, kuqukwa neenkunzi ezininzi ezinganeno ngobudala. Iintlobo zezilwanyana ezibonakala ngathi ziintlobo ezingachazwanga ze-*Spiroctenus* Simon, 1889 (akwenzeki ukuqiniseka de zibe iinkunzi ezinganeno zifikelele ekuvuthweni); kwa ezi ntlobo zinye zange zaziwe ngokufanelekileyo ngexa lophando lokuqala njengeentlobo ze-*Ancylotrypa* Simon, 1889 (iSigcawu se-Wafer-lid Trapdoor).

Iintlobo zeSigcawu esiXhaphakileyo esiyiMfene (Common Baboon Spider) seqela le-*Harpactira Ausserer*, 1871 naso sathathwa kwisiza sase-Bantamsklip. Izilwanyana eziza kuvavanywa ezithathiweyo zonyulwa njegokuba yi-*Harpactira* cf. *cafreriana* (Walckenaer, 1837), ISigcawu saseKoloni esi-Orenji esiyiMfene saseKoloni (Cape Oranje Baboon Spider), kodwa ukusazi ngokuqinisekileyo akunakwenzeka de ibe inkunzi endala yeqela e-Bantamsklip ithathiwe (kwathathwa iimazi kuphela ngexa lophando lwangaphandle lukaDisemba 2013) Izilwanyana eziza kuvavanywa ezithathiweyo zibonakala zohluke kakhulu kwi-H. *cafreriana* eqhelekileyo.

Ukuze kukwazeke ukuthelekisa ezi ziza zithathu ngokweentlobo zezilwanyana zeDatha eBomvu, zonke iintlobo zezilwanyana ezidweliswe kumaPhondo eNtshona kunye neMpuma Koloni oMzantsi Afrika ziqukiwe kolu hlolo.

Iintlobo zezilwanyana ezingenamiqolo eziphelelelyo ezingama-47 ezisongelwayo (VU, EN ne-CR ezidwelisiweyo) zidweliselwe amaphondo amabini (Onychophora, Gastropoda, Diplopoda, Odonata ne-Lepidoptera). Ezi ndidi zilandelayo zolondolozo ziqukiwe:

- Iintlobo zezilwanyana ezilishumi elinethoba zidweliswe njengezingaKhuselekanga;
- Iintlobo zezilwanyana ezilishumi elinesine zidweliswe njengeziseNgozini; kwaye
- Iintlobo zezilwanyana ezilishumi elinesine zidweliswe njengeziseNgozini enkulu.

Amashumi amane ananye kumashumi amane anesixhenxe ezi ntlobo zezilwanyana awarekhodwanga kwimimandla leyo zizinze kuyo iziza zophononongo (zaziwa kwenye indawo kumaphondo eMpuma kunye neleNtshona Koloni) kwaye ezintandathu kwezi ntlobo zezilwanyana ziyaziwa kwimimandla kwindawo ozinze kuwo ummandla wophononongo. Akukho nalunye kwezi ntlobo zezilwanyana ekucingwa ukuba kusenokwenzeka ukuba lube khona kuso nasiphi na kwiziza zophononongo – indibaniselwano yokubukho obaziwayo kwingqingqi kunye neemfuneko ezikhethekileyo zendawo yokuhlala yezi ntlobo zezilwanyana akuhlangatyezwananga nayo kwiziza zophononongo.

Ngokusekelwe kwiziphumo ezifunyenwe ngexa lolu phononongo kucacile ukuba isiza sophononongo sase-Bantamsklip sinobuthathaka obuphezulu bezilwanyana ezingenamiqolo kwaye ke sithathwa ngokuba asifanelekanga kwiSikhululo saMandla seNyukliya esicetywayo. Akukho nasinye kwezi ziphumo esikhombisa ukungafaneleki

kwiziza zophononongo zase-Duynefontein kunye ne-Thyspunt ngokuphathelene neSikhululo saMandla seNyukliya esicetywayo.

Kwenziwa isincomo sokuba isiza sophononongo sase-Bantamsklip sikhutshelwe ngaphendle njengesiza esinokuba seseSikhululo saMandla seNyukliya esicetywayo.

1.14 Uvavanyo Lwempembelelo Yaselwandle (Appendix E15)

Olu phononongo lweengcali, lwenziwe ukuvavanya iimpembelelo ezinokwenzeka zesikhululo samandla somthamo wama-4 000 MW kwimekobume esingqongileyo yaselwandle kwiziza ezithathu ezinokwakhiwa ecaleni kwamanxweme aseMpuma naseNtshona Kapa. Uphuhliso olunjalo eDuynefontein, eBantamsklip okanye eThyspunt, luya kuba neempembelelo zeentlobo ngeentlobo ezinokwenzeka. Ezi ziquka:

- Ukuphazamisa ikhaya lendalo lezilwanyana nezityalo kummandla waselwandle. Xa kusakhiwa inkqubo eyayanyaniswa nesikhululo yokungenisa nokukhupha amanzi okupholisa, esi siphumo siya kujolisa kwisigaba sokwakha yaye siya kuba sesaloo ndawo, esexesha nokubaluleka okuphakathi. Xa sisayanyaniswa nokulahla izinto ezingafunwayo, ukuphazamiseka kwemekobume yaselwandle kubalulekile. Xa kuncitshiswa ngokulahla izinto ezingafunwayo kude nonxweme (nangokusebenzisa nje ukumpompa ngezinga eliphakathi eThyspunt), impembelelo iyancitshiswa ibe yeyesiphumo esiphakathi kwanokubaluleka okuphakathi. Izithintelo zeempembelelo zethutyana nezendawo ezayanyaniswa nokulahla izinto ezingafunwayo kwiintlanzi zechokka squid eThyspunt, ziya kuba nempembelelo encinane kumhlambi uwonke wesquid, xa kuthathelwa ingqalelo ummandla obanzi ezibekela kuwo amaqanda ezi ntlobo.
- Ukuhanjiswa nokufa kwezinto eziphilayo okwayanyaniswa nokungeniswa kwamanzi okupholisa. EDuynefontein naseThyspunt akulindelekanga ukuba ukuhanjiswa kube neempembelelo ezibalulekileyo kwizinto eziphilayo neendawo zazo zokuhlala. Nangona kunjalo, eBantamsklip ukuhanjiswa kwemibungu (larval) kungaba neziphumo ezibalulekileyo ezingalunganga kwimihlambi yengingqi ye-abalone *Haliotis midae*.
- Ukukhutshwa kwamanzi ashushu asetyenziswa ngeenjongo zokupholisa. Uyilo lwetonela yenkqubo yokukhupha inciphisa iimpembelelo ezingalunganga ezinokwenzeka, ngokusebenzisa iindawo ezininzi zokukhupha ngenjongo yokuncedisa ukusasaza ubushushu obugqithisileyo, ngokukhulula amanzi okupholisa ngaphezulu komphantsi wolwandle ukunciphisa iziphumo kwimekobume yeengcongolo ezingqongileyo nangokusebenzisa izinga eliphezulu lokumpompoza kwindawo yokukhulula ukukhulisa ukuxubana namanazi apholileyo ommandla. Ukuzekelisa okuqukayo kwezifundo zolwandlekazi, kubonise ukuba iziphumo zobushushu okuphakanyisiweyo kulindelwe ukuba zijoliswe kwikhaya lendalo lezilwanyana nezityalo elisemanzini avulekileyo. Oku kuphathelele ngokukodwa kwiBantamsklip yaye ngeqondo elinganeno kwiThyspunt, njengoko kunokunceda ukunciphisa iimpembelelo kwiikhepsule zamaqanda e-abalone ne-chokka squid ngokwahlukahlukeneyo. Xa i-chokka squid kwisiza saseThyspunt kulindelwe ukuba iphephe ubushushu bamanzi obuphakanyiswe ngaphezulu kwezinga lazo lokunyamezela ubushushu, ummandla okuqikelelwa ukuba uza kuchaphazeleka umele ubukhulu obunganeno kwepesenti enye yommandla waselunxwemeni wokubekela amaqanda. Kukhuthazwa ngamandla ukuba eBantamsklip kusetyenziswe itonela elahla kude nonxweme, yokukhulula amanzi ashushu ngenzame yokunciphisa iimpembelelo kwi-abalone. Ngokubalulekileyo inkqubo

yokukhulula kufuphi nonxweme kwesi siza kucingwa ukuba ivelisa ingozi engamkelekiyo kwimihlambi yee-abalone.

- Ukukhulula amanzi amdaka asuswe ityuwa. Ngexesha lokwakha imithamo embalwa yamanzi amdaka aneetyuwa eninzi kakhulu, aya kukhululwa ngqo ukungena kummandla wamaza angaselunxwemeni, apho intshukumo ephakamileyo yamandla amanzi iya kuba nesiphumo esaneleyo sokuwaxuba namanzi ommandla wamanzi olwandle, ukuqinisekisa impembelelo encinane kwimekobume yaselwandle. Ngexesha lesigaba sokusebenza amanzi amdaka asuswe ityuwa aya kukhululwa ngaxeshanye namanzi apholisayo. Njengoko umxube wamanzi netyuwa uya kuxubeka ukuya kumazinga angaqaphelekiyo phambi kokukhululwa akukho mpembelelo iqikelelwayo kwimekobume yaselwandle evela kula manzi amdaka ngexesha lesi sigaba sophuhliso.
- Ukukhululwa ngokungeyonjongo kwezinto ezikhutshwa kukusasazeka kwemitha. Uyilo lobuchwepheshe lwenkqubo yokupholisa luyinciphisile le ngozi, kangangokuba le mpembelelo ibekwe kwizinga lesiphumo esiphantsi nokubaluleka okuphantsi.
- Ukhuselo olongezelelweyo lwezinto eziphilayo zaselwandle ekuxhatshazweni ngenxa yothintelo kummandla wokhuseleko. Isiza esingazuza kummandla onjalo wothintelo singaba yiBantamsklip kuphela, njengoko oku kungaba luncedo olukhulu kwimeko yangoku yokuvuna ngokungekho mthethweni kwemihlambi yee-abalone. Nangona kunjalo, ukuze inzuzo enjalo izaliseke unyanzeliso olwaneleyo lommandla wothintelo kufuneka lubonelelwe.
- Ukukhutshwa kwamanzi amdaka edolophu anyangiweyo. La manzi amdaka kufuneka amelane nemigangatho ebekwe liSebe leMicimbi yaManzi naMahlathi yaye, ngaloo ndlela, ayikho impembelelo ebalulekileyo elindelweyo kwimekobume yaselwandle.
- Ungcoliseko lwemekobume yaselwandle kukukhutshwa kwamanzi omhlaba angcoliswe ziimbumba zezinto ezibolayo, iibhaktheriya okanye ikhaboni yamanzi. Njengoko le mpembelelo kungalindelwanga ukuba yenzeke yaye iya kuthintelwa ngokwendawo nethutyana, kucingwa ukuba inesiphumo nokubaluleka okuphantsi.

Ngaphandle kweempembelelo zophuhliso olucetywayo kumakhaya endalo ezilwanyana nezityalo zaselwandle, izinto eziphilayo kwimekobume yaselwandle nazo kananjalo zinempembelelo kuphuhliso. Oku kungenzeka ngendlela yokungcoliswa kwemibhobho yamanzi okupholisa. Le mpembelelo kulindelwe ukuba ibaluleke kakhulu eDuynefontein, ngenxa yendawo ekuyo ecaleni konxweme lwasentshona, apho iintyatyambo ze-jellyfish zibonakala zisanda ngokwenzeka rhoqo.

1.15 Iinzululwazi Zaselwandle (Oceanography) (Appendix E16)

EMzantsi Afrika ukukhula kwezoqoqosho kunye neemfuno zasekuhlaleni zikhokelela kwimfuno enkulu yombane ukuba ihlangabezane nemfuneko zonikezo lombane. I-Eskom ke ngoko iceba ukwakha isiKhululo samaNdla e-Nuclear (Nuclear Power Station) (NPS) esenza umthamo wamandla ombane ayokuma kwi-4000 MW kusetyenziswa ubuchwepheshe be- Pressurised Water Reactor (PWR).

Le ngxelo iphonononga iimpembelelo zokusingqongileyo kwaselwandle okuphathekayo okwenziwe kukwakhiwa nokusebenza kwe-NPS kwiindawo ezintathu ezinokusebenza, ezizezi; Duynefontein, Bantamsklip ne-Thyspunt. Ukongeza kwiimpembelelo ze-NPS kokusingqongileyo kwaselwandle okuphathekayo, iimpembelelo zezehlo zeziphango,

ukutshintsha kwezimo zezulu neentlekele zendalo ezifana neetsunami ezichaphazela ukusebenza kunye nokhuseleko lwee-NPS zaye zathathelwa ingqalelo.

Iimpembelelo zeNzululwazi zaseLwandle ezinxulumene nesigaba sokwakha zithathwa ngokuba azibalulekanga kakhulu kwaye ziyafana kwindawo nganye yezi zintathu ekunokwakhiwa kuzo.

Ububanzi be-thermal plume kwindawo nganye buguquka kakhulu kwaye buxhomekeke kwiimeko zomoya kunye namaza ngalo naliphi na ixesha elithile. Ucazululo lokukhutshwa kwe-thermal plume kwindawo nganye kukhombisa ukuba kwenzeka ukhutsho olungeluhlanga e-Thyspunt, apho i-plume ibonwa kakhulu elunxwemeni ize ingabinzulu ngakwimimandla eselunxwemeni. Olona khutsho lukhulu lwe-thermal plume lubonwa e-Duynefontein.

Iimpembelelo kwi-NPS ezibangwa kokusingqongileyo kwaselwandle okuphathekayo kuya kuvela kwizikhukula ezivela elwandle kunye nokuphazanyiswa kwamanzi okupholisa. Ukuphazanyiswa kwamanzi okupholisa kwathathwa njengokungabalulekanga kakhulu kwindawo eyiyenye nganye ngenxa yobunzulu bendawo ekungena kuyo amanzi kunye namanyathelo okudambisa afakwe kuyilo lwenkqubo yokupholisa amanzi kwindawo angina kuyo.

Kungenzeka ukuba amanqanaba amanzi ayodlule indawo ekucetywe ukuba iphakanyiswe iyokuma kuyo i-NPS kuzo zontathu iindawo ukuba nje itsunami inokwenzeka ngexesha elinye neemeko zemozulu ezigqithisileyo (isehlo se-meteo-tsunami). Ukwenzeka kwetsunami, nakuba kunjalo, akunakufane kwenzeke ngenxa yengozi esezantsi exeliweyo yemisebenzi yeenyikima kulwandlekazi olujikelezileyo. I-Thyspunt yeyona ndawo ekukuphela kwayo enamanqanaba amanzi aphezulu ngokugqithisileyo avela kwimiba yezemozulu ekuthelekelelwa ukuba yodlula i- + 10 m MSL ngexa lexesha lonke lokufakwa kwayo. Ngako oko, amanqanaba athelekelelwayo amanzi e-Thyspunt ngexa le-meteo-tsunami angaphezulu kakhulu kunawase-Bantamsklip nase-Duynefontein.

Kwenziwa isincomo samanyathelo okudambisa ngokufanelekileyo kuwo ngamnye kule miba ibalulekileyo yeenzululwazi zaselwandle ichongiweyo.

1.16 Soqoqosho (Appendix E17)

UEskom uceba ukwakha isikhululo samandla senyukliya esivelisa amandla omthamo ofikelela kuma-4,000 MW kwisiza ngasinye kwezintathu, oko kukuthi iThyspunt eMpuma Koloni, iBantamsklip eNtshona Koloni neDuynefontein eNtshona Koloni. Injongo yophononongo kukuhlalutya ukusebenza ngexabiso elihle ngokwezoqoqosho kweziza ezithathu kubahlali abalindelekileyo ngokubanzi. Oku kuquka inkunzi (imali yesiseko) neendleko zokusebenza zomboneleli weenkonzo kwakunye neendleko kubahlali, kuthathelwa ingqalelo izinto ezilungileyo nezingalunganga zangaphandle kuqoqosho nokusingqongileyo. Uphononongo kananjalo lucinga ngempembelelo yoqoqosho olukhulu ngokubanzi lweziza ezithathu kuqoqosho lwamaphondo azo asemxholweni.

Indlela yophononongo yakhiwe ngomdibaniso wophando lwekhompyutha, udliwano-ndlebe kummandla nokusetyenziswa kwenkcazelo eqokelelwe ukwenza umzekelo woqoqosho olukhulu.

Isiza saseDuynefontein sikummandla ophuhliswe kakhulu nophucukileyo kuneziza ezibini (iBantamsklip neThyspunt). Uqoqosho olumbaxa lwaseKapa luya kufumana kulula kakhulu ukwamkela nokukhonza isikhululo samandla senyukliya nabasebenzi baso kunoko bekunokwenzeka eThyspunt okanye eBantamsklip.

Iimbono ngokuphathelele isikhululo samandla senyukliya zidla ngokuselwa ekusileleni kolwazi lwenzululwazi malunga neempembelelo ezibonwayo. Amadliwanondlebe ethu kummandla abonise ukuba umphakamo wexhala labantu liphantsi kummandla ongqonge iDuynefontein ngenxa yamava abo aseKoeberg; ngokuchaseneyo, kukho inkcaso ebonakalayo kwisikhululo samandla senyukliya kwiziza ezinye ezibini. Ngokubanzi, amacandelo eshishini kuzo zontathu iziza abona amathuba avelayo ekusekweni kwesikhululo samandla senyukliya, ngokwahlukileyo kukubaluleka kokuzinzisa uphakelo lombane.

Awona mashishini mabini anovakalelo ngokweembono zawo malunga neempembelelo zeNyukliya-1 kwimisebenzi yawo lelokuloba iintlanzi nelokhenketho. Nangona kunjalo, uhlalutyo lubonisa ukuba naziphi iimpembelelo ezingalunganga kunokwenzeka zibe ncinci kwanokuthi ezinyanisweni kunokubakho iimpembelelo ezilungileyo ngokubanzi kukhenketho.

Uhlalutyo lwempembelelo kuqoqosho olukhulu lunika iziphumo ezixubeneyo zezigaba zokwakha nezokusebenza kwiziza ezithathu. Izalathisi zoqoqosho olukhulu zithanda iziza zaseNtshona Koloni kodwa izalathisi zamakhaya nezentlalo zithanda iThyspunt. Uhlalutyo lokusebenza kakuhle kwexabiso lubonisa ukuba iThyspunt inomda omncinci kakhulu ngaphezu kweDuynefontein nomda omkhudlwana ngaphezu kweBantamsklip. ***Umahluko phakathi kweThyspunt neBantamsklip ngama-R6.388 eebhiliyoni, yaye xa uxelwa ngepesenti umahluko sisi-5.93% ngokulungele iThyspunt. Phakathi kweThyspunt neDuynefontein umahluko ngama-R570 ezigidi, okanye i-0.53% ngokulungele iThyspunt.*** Ngako oko, ulandelelwano lokuthandeka (ukusuka kwesona sithandwa kakhulu ukuya kwesona sithandwa kancinci) yiThyspunt, iDuynefontein neBantamsklip. Nangona kunjalo, umahluko mncinci, yaye zonke iziza zinokuba neempembelelo ezinkulu ezilungileyo zoqoqosho kummandla wengingqi nowephondo ezikulo.

Amanyathelo okunciphisa acetywayo anxulumene nokusebenza nokulondoloza (ngokukodwa imiba yezakhono), iimbono namaxhala oluntu, kunye nembuyekezo.

1.17 Lwempembelelo Kwezentlalo (Appendix E18)

Imvelaphi

IOctagonal Development cc (Alewijn Dippenaar) yalathelwe ukuqhuba uVavanyo lweMpembelelo kwezeNtlalo (iSIA) yokwakhiwa okucetywayo kwesikhululo samandla senyukliya kunye nezibonelelo zokusebenza ezayamene naso, kwiziza ezithathu apho esinye sikwiPhondo laseMpuma Koloni nezinye ezibini kwiPhondo laseNtshona Koloni. Iziza ezithathu ezichongwe ngokutshintshisanayo kubhekiswa kuzo njengezi:

- iThyspunt;
- iBantamsklip kunye
- neDuynefontein.

Ingxelo enxulumene neSIA yahlulwe yazizahluko ezine, ezizezi:

- Icandelo loku-1: Intshayelelo;
- Icandelo lesi-2: Inkcazo yokusingqongileyo okuchaphazelekayo;
- Icandelo lesi-3: Ukuchongwa kwempembelelo, uvavanyo namanyathelo okunciphisa/okwandisa; kunye
- Necandelo lesi-4: Izigqibo neenkuthazo / izincomo

Iprojekthi (IsiKhululo saMandla seNyukliya*)*

UEskom uceba ukwakha isiKhululo saMandla seNyukliya ekubhekiswa kuso njengeNyukliya-1 esivelisa amandla omthamo oya kufika kuma-4 000 MW, sisebenzisa ubuchwepheshe beReactor yaManzi aXinzelelweyo (Pressurised Water Reactor) (PWR). Ngeendlela ezininzi isakhiwo somatshini wenyukliya sifana nesomatshini oqhelekileyo wamandla omsinga womoya oshushu (thermal). Umahluko phakathi koomatshini bamandla benyukliya nabaqhelekileyo ababaselwa ngefosili (oko kukuthi ngamalahle) ngumthombo wezibaso nendlela obuveliswa ngayo ubushushu. Kumatshini wefosili kubaswa ioli, igesi okanye amalahle kwibhoyila, nto leyo ethetha ukuthi amandla ekhemikhali yezibaso ajikwa ukuba bubushushu. Kwisikhululo samandla senyukliya umthombo wezibaso uphuculwa ngeyuraniyum yaye kusetyenziswa amandla avela ekusabeleni kokucandeka kwetyathanga lenyukliya.

Inkqubo yokwenene yokwakha iNyukliya-1 ingathatha malunga neminyaka eli-9 ukuba igqitywe yaye iquka imiba ephathelele ukusekwa kwesiza, ukomba ngemilinganiso emikhulu, imisebenzi yoburhulumente, iindlela zokufikelela nokwakhiwa kwereactor.

Ulwazi olubonelelwe nguEskom (ngoSeptemba, 2008) lunika iinkcukacha zendawo efunekayo yokuhlalisa isikhululo samandla senyukliya yeNyukliya-1 esicetywayo. Kufuneka kugxininiswe ukuba iinkcukacha zeemfuneko zokuhlalisa nokudibanisa kwiindawo zabahlali needolophu ezikhoyo kusafuna kuthethathethwane noomasipala ngokwahlukahlukeneyo nabanye abathathi nxaxheba apho kufanelekileyo. Ukubekeka ngqo komzi onokubakho wokwakha kusafuna ukuqinisekiswa emva kokuba isiza esithandwayo sichongiwe.

Imimandla yomhlaba iya kugqitywa ngokwemimiselo yokuxinana kweendawo zokuhlala emiselweyo sisiCwangciso soPhuhliso lwesiThuba neNdawo (Spatial Development Plan) malunga neepropati ezifumanekayo. UEskom kufuneka abonelele ngomhlaba owahlulwe ngokutsha ukwenzela umThengisi akhe uMzi woKwakha wabasebenzi abakude namakhaya (amagoduka). Yimfanelo kaEskom ukulungiselela inkqubo yeEIA.

Ngaphezu koko, uEskom angabonelela ngeziza zokuhlala ezifakelwe iinkonzo ukwenzela umThengisi akhe iindawo zokuhlala zesitafu (uMzi weSitafu). Iindawo zokuhlala ziya kugqityezelwa akuba umThengisi enyuliwe, yaye uphuhliso lomhlaba luya kufakelwa kubuchule bokudibanisa abahlali ngokubanzi ukwenzela uphuhliso lweendawo zokuhlala zakwaEskom.

Injongo yengxelo

Injongo yale ngxelo kukubonelela ngeziphumo zophando zeSIA, ngokukodwa njengoko zinxulumene neziza ezithathu, oko kukuthi iThyspunt, iBantamsklip neDuynefontein.

Imele uvavanyo olunzulu lweempembelelo zentlalo ezinokubakho, iquka ukulinganiswa kweempembelelo njengoko kufunwa yimiThetho yeEIA, ukubaluleka koko nemilinganiso yokunciphisa nokuphucula iimpembelelo ezilungileyo nokunciphisa iimpembelelo ezingalunganga.

Iingcinga/izigqibo zokuzenzela neeNtsilelo

Izigqibo zokuzenzela ezilandelayo zithathelwe ingqalelo kule ngxelo:

- Urhulumente woMzantsi Afrika uza kuqhubeka ngenjongo yakhe yokulandela ngenkuthalo amandla enyukliya kwithuba leminyaka ezayo elishumi ephindwe kabini njengoko kubonisiwe kwiThe Nuclear Energy Policy and Strategy for the Republic of South Africa (DME, 2007);
- Abantu abahlukileyo badla ngokubona iinyaniso zobomi ngokwahlukeneyo yaye ngako oko impembelelo enokubonwa ingalunganga ngumtu okanye umzi othile, inokubonwa iyeyona ilungileyo neyona mpembelelo ilungileyo ngumntu olandelayo;
- Ukubonisana nabantu, ngenjongo yokufumana ukuqonda imiba, kunemida/iintsilelo, ikakhulu ngenxa yenyaniso yokuba abantu/amaqela abazimiseli ngamaxa onke ukuza nokuthatha inxaxheba kwiingxoxo neeseshoni zokubonisana. Ngamaxa amaninzi abantu bayathandabuza ukunika igalelo ngokuphandle kwiindibano zeqela yaye ukuqhuba iindibano zodliwano-ndlebe akwenzeki ngamaxa onke okanye akwamkeleki;
- Nangona iStatistics SA ibonelela ngeenkcukacha-manani ezithile ezihlaziyiweyo rhoqo, zibakho izithuba kwidata esemthethweni efunyanwa kweli ziko. Nangona le ntsilelo yedata yakutshanje yommandla othile inomba wentsilelo, ezi ntsilelo azibanganakho ukungoyiswa, ukuba azichanekanga kangako, uqikelelo lungafunyanwa ngokuthelekisa idata efumanekayo neenkqubo ezihlaziyiweyo zePhondo nezeSizwe;
- Xeshikweni yonke imizamo yenziwe yokunikela ngethuba kuwo onke amaqela achaphazelekayo nanomdla ukuthatha inxaxheba kolu phononongo, iziphumo zophononongo azinakho ukusebenza jikelele kubo bonke abemi bophando. Ngako oko, xa kuhlalutywa iziphumo, kuthathwa izigqibo ngokuphathelele iimpawu neembono zaloo maqela anomdla nachaphazelekayo (iiI neeAP) athathe inxaxheba kuphononongo;
- Izintlu zovavanyo lwempembelelo zidala intsilelo yeempembelelo zentlalo ngengqiqo yokuba izintlu azivumeli uthelekiso phakathi kweempembelelo ezinobunzima obuqhotyoshelweyo nezo zingenabo. Ayizizo zonke iimpembelelo ezinexabiso elifanayo yaye asiyiyo inxalenye yezintlu zempembelelo ukuvavanya ixabiso elayamene nempembelelo nganye ngokusingisa kwisazobe sesalathiso.

Indlela yokusebenza neNkqubo yoPhononongo

Indlela yokusebenza eqondwayo, yokusebenza ngoonxantathu, isetyenzisiwe ukuqokelela nokuhlalutya idata ngexesha lolu phononongo, njengobuchule obamkelekileyo bovavanyo lwempembelelo.

Indlela yokusebenza esetyenziselwe iSIA ihambelana neInternational Association for Impact Assessment (IAIA) nezikhokelo ezibalulwe kwiWestern Cape Department of Environmental Affairs and Development Planning's Guidelines malunga nokubandakanyeka kweeNgcali zeNtlalo kwiEIA.

Indlela yokusebenza yokuxuba ubuninzi nobulunga iyasetyenziswa yaye, ihambelana nale ndlela yokusebenza.

Malunga nesigaba ngasinye sezigaba ezibini zesiseko zeprojekthi, oko kukuthi, esokwakha nesokusebenza, iimpembelelo neenzuzo zangoku nezexesha elizayo ezinokubakho, ezayamene kuphela nophuhliso olucetywayo, zichaziwe zavavanywa, zozibini ngaphambi nasemva kokunciphisa/ukwandisa ngokwemilinganiso emiselweyo yokuvavanya.

Ukuchonga nokuvavanya impembelelo: yesigaba sokwakha nesokusebenza

Iimpembelelo ezilandelayo zentlalo zichongiwe zaza zavavanywa:

- Iindawo zokuhlalisa isitafu nabasebenzi bokwakha;
- Ukungena ngamandla kwabafuni bomsebenzi;
- Ukwanda kwenani leendawo zokuhlala ezingekho mthethweni (amatyotyombe);
- Ukudala amathuba engqesho;
- Amathuba okushishina;
- Impembelelo kwimisebenzi yolwaphulo-mthetho;
- Iingozi zeeSTD, zeHIV neAIDS;
- Iinkonzo zikamasipala;
- Iimpembelelo zezihamba-ndlela;
- Impembelelo yengxolo nothuli;
- Ukulahleka kwengqesho emva kokwakha;
- Iimpembelelo zembonakalo;
- Impembelelo kwizibonelelo zokusebenza zentlalo kunye namancedo;
- Impembelelo kuvakalelo lwendawo;
- Isicwangciso sokusebenzisa umhlaba kwixesha elizayo;
- Iingozi ezibonwayo eziyamana neziganeko zenyukliya;
- Uvavanyo lokhetho lokungaphuhlisi.

Uvavanyo belusekelwe kuphengululo:

- Lwamaxwebhu okucwangcisa nomgaqo-nkqubo ophathelele kummandla;
- Lweenkqubo zodliwano-ndlebe namaqela angundoqo anomdla nachaphazelekayo;
- Lwemiba yezentlalo eyamene neenkqubo zophuhliso ezifanayo; kunye
- Namava ombhali kummandla weeSIA.

Ngoku kuxoxwa ngokufutshane ngempembelelo nganye.

Indawo zokuhlala zesitafu nabasebenzi bokwakha

Amanani aphezulu abasebenzi aya kubeka uxinzelelo olungamandla ekuboneleleni ngeendawo zokuhlala zethutyana nezisisigxina. UmThengisi nesitafu sikaEskom baquka ukungena ngamandla kwabasebenzi abaqikelelwa kuma-3 837 (ngexesha elisencochoyini) kunye neentsapho zabo kummandla weprojekthi yesikhululo samandla senyukliya. Ukungena kwabemi bebonke kuqikelelwa abantu abangama-10 500, bokuhlaliswa kummandla omalunga ne-167.2 ha.

Kuya kufuneka uMzi woKwakha uhlalise abantu abamalunga nama-3 750. Ukubekeka koMzi woKwakha kusafuna ukuqinisekiswa, yaye yimeko enovakalelo enamathuba neenzuzo ezixabisekileyo, kodwa kananjalo zakubakho iimpembelelo ezingalunganga kwintlalo-ntle yabantu.

Amanyathelo okunciphisa ukubonelela ngeendawo zokuhlala ezaneleyo kufuneka azalisekiswe.

Ukungena ngamandla kwabafuni bomsebenzi

Le mpembelelo ijongene nokungena ngamandla kwabafuni bomsebenzi kwisiza ngexesha lesigaba sokwakha. Aba bafuni bomsebenzi, kuquka abo abavela kwimimandla engaphandle “kwengingqi” bangena kummandla ngethemba lokufumana ingqesho. Xa beyifumene ingqesho, ithuba linokubakho lokuba baya kuba negalelo kwingxaki ekhoyo yeendawo zokuhlala ezingekho sikweni (amatyotyombe), uxinzelelo kwimithombo yamancedo ekhoyo, iinkonzo nezibonelelo zokusebenza. Ithuba likho ngaphezu koko lokuba banokuba negalelo malunga nolwaphulo-mthetho nezinye iingxaki zentlalo ezifana, nokusebenzisa utywala (ialkoholi) ngobugwenxa nokuthengisa ngemizimba.

Amanyathelo okunciphisa anenjongo yokunciphisa inani labafuni bomsebenzi abahlala kummandla.

Uphuhliso oluNgekho sikweni kwakunye neeNdawo zokuhlala (amatyotyombe)

Ukwanda kophuhliso olungacwangciswanga neendawo zokuhlala ezingekho sikweni ukujikeleza isiza sesikhululo samandla senyukliya kwayanyaniswa namathuba ezoqoqosho abonwayo. Ukuba akulawulwa ngononophelo, olu hlobo lophuhliso olungalawulwayo nalo kananjalo lunokuba nesiphumo sokwanda koluhlu lwezifo zentlalo ezifana nolwaphulomthetho, ukuthengisa ngemizimba nokusebenzisa ngobugwenxa ialkoholi neziyobisi.

Amanyathelo okunciphisa anenjongo yokulawula isoyikiso sokwanda kophuhliso olungacwangciswanga nokwanda kweendawo zokuhlala ezingekho sikweni (amatyotyombe).

UkuDala amaThuba eNgqesho

Isikhululo samandla senyukliya sinika ithuba kubantu abangekho engqeshweni ukufumana ingqesho enentsingiselo ngexesha lesigaba sokwakha. Kuqikelelwa ukuba isigaba sokwakha singathatha ukuya kwiminyaka eli-9 ukusuka ekuqaleni kokwakha ukuya ekugunyaziseni. Ngethuba leli xesha kuqikelelwa ukuba malunga nesitafu esingama-8 737, kuquka abasebenzi bokwakha, baya kuqeshwa kwisiza. Kulindelwe ukuba ubuncinane abangama-25% babasebenzi bokwakha baya kuthathwa kubasebenzi bengingqi.

Amanyathelo okwandisa anenjongo yokuphucula amancedo okudala ingqesho.

Amathuba okuShishina

Inani eliphathekayo lamathuba okushishina aya kudalelwa iinkampani zengingqi/ababoneleli beenkonzo neeSMME.

Ukusebenzisa abaxhobisi bengingqi nabanikeli beenkonzo kufuneka kukhuthazwe ngokuthenga kwingingqi neenkqubo zokwalatha kwangaphambili ngokusebenzisa iinkqubo zeziniki-maxabiso (iithenda) ezivulekileyo neziselubala malunga nayo yonke imisebenzi enxulumene nokwakha.

Impembelelo kwiMisebenzi yoLwaphulo-mthetho

Isiphumo sokungena ngamandla kwabantu abaninzi kummandla njengabaqeshwa okanye ukufuna umsebenzi, kungaba nesiphumo sokwandisa imisebenzi yolwaphulo-mthetho. Kananjalo kunokwenzeka ukuba ngexesha lesigaba sokwakha seprojekthi, amalungu olwaphulo-mthetho ajonga amathuba angasebenzisa ukwanda kwemisebenzi kwimimandla ethile ukujikeleza kwiziza zokwakha.

Amanyathelo okunciphisa anenjongo yokunciphisa ingozi yolwaphulo-mthetho.

Iingozi zeeSTD, iHIV neAIDS

Le mpembelelo ibhekisa ekwandeni kwengozi yeeSTD neHIV neAIDS. Kuxeliwe ngokubanzi ukuba ukwanda kwengozi yeeSTD, iHIV neAIDS kwayanyaniswa nokungena ngamandla kwabasebenzi, ngokukodwa abasebenzi abangamagoduka (migrant workers), kunye/okanye nakuphi ukwanda kweelori zezihamba-ndlela ukungena okanye ukuphuma kummandla.

Amanyathelo okunciphisa anenjongo yokulawula iingozi eziyamaniswa neeSTD, iHIV neAIDS.

Iinkonzo zikaMasipala

Le mpembelelo ijongene nokulindeleka kokwenzeka kokuba isikhululo samandla senyukliya mhlawumbi sinzimele iinkonzo zikamasipala ezifana namanzi, ezococeko, iindlela, inkunkuma nokulahlwa kwenkunkuma.

Amanyathelo okunciphisa anenjongo yokubonelela ngeenkonzo ezifunekayo.

Iindlela nezoThutho

Inkxalabo ngumthamo weendlela nezibonelelo zokusebenza zothutho ezifunekayo ngexesha lokwakha nokusebenza kwesikhululo samandla senyukliya.

Amanyathelo okunciphisa anenjongo yokucwangcisa, ukuxhasa ngemali nezibonelelo zokusebenza zokwakha nokusebenza kwesikhululo samandla senyukliya, ngaphezu koko, neendlela nezibonelelo zokusebenza zothutho zeendawo zokuhlala ekufuneka ziphuhliselwe ukuhlala kwesitafu nabasebenzi bokwakha.

Ukususwa kweNkunkuma nokuNgcola

Oku kuphathelele kwiZiza zoMhlaba wokuDiba nokuThuthwa kweNkunkuma ezifunekayo ukwenzela ukwakha nokusebenza kwesikhululo samandla senyukliya,

kwakunye neenkonzo nezibonelelo zokusebenza kwiindawo zokuhlala ekufuneka ziphuhliselwe ukuhlala kwesitafu nabasebenzi bokwakha.

Amanyathelo okunciphisa anenjongo yokubonelela ngokwaneleyo ngeZiza zoMhlaba wokuDiba nezoThutho lweNkunkuma ukwenzela ukwakha nokusebenza kwesikhululo samandla senyukliya kwakunye neenkonzo zokususa inkunkuma kwiindawo zokuhlala ekufuneka ziphuhliselwe isitafu nabasebenzi bokwakha.

Iimpembelo zeziHamba-ndlela

Ukwanda kokuhamba kwezithuthi ngexesha lesigaba sokwakha kunokuba nefuthe kwimpilo yemihla ngemihla neepateni zokuhamba kwamalungu abahlali kwiilali ezingqonge isiza.

Amanyathelo okunciphisa anenjongo yokwandisa ukuhamba kwezithuthi ngexesha lesigaba sokwakha ukunciphisa iingxaki zengxinano yezihamba-ndlela kummandla, nto leyo eya kuba nefuthe kwimpilo yemihla ngemihla neephatheni zokuhamba zamalungu abahlali abasebenzisa ezi ndlela kwiilali ezingqonge isiza.

Iimpembelelo zeNgxolo noThuli

Ukwanda kwamazinga engxolo nothuli kungadala impembelelo engalunganga kubulunga bempilo yabantu abahlala kufuphi nesiza sesikhululo samandla senyukliya esicetywayo.

Amanyathelo okunciphisa anenjongo yokuthintela ukuphazamiseka neziphumo zengxolo engqondweni nokungcoliseka luthuli.

Ukulahleka kweNgqesho emva koKwakha

Imisebenzi eliqela iya kulahleka sakuba isikhululo samandla senyukliya sigqityiwe ukwakhiwa. Amanyathelo okunciphisa anenjongo yokunciphisa ubuninzi bemisebenzi elahlekayo emva kokwakhiwa.

Iimpembelelo zembonakalo

Isikhululo samandla senyukliya siya kutshintsha iimpawu nobulunga bembonakalo yesimo sendawo ngokuya ngokoPhononongo lweNgcali lweMbonakalo (Visual Specialist Study) (ngoSeptemba wama-2009).

Amanyathelo okunciphisa anenjongo yokuthintela iziphumo ezingalunganga nokuphazamiseka kovakalelo lwendawo okunokwenziwa sisikhululo samandla senyukliya. Isisombululo sinokuba kukufezekisa amanyathelo okunciphisa acetyiswe kuphononongo lwempembelelo yembonakalo.

Impembelelo kwiSibonelelo sokusebenza sezeNtlalo / amancedo ezeNtlalo

Le mpembelelo ibhekisa kwimo yokungathi isikhululo samandla senyukliya esicetywayo sibeka ubunzima kwizibonelelo zokusebenza ezikhoyo ezifana namancedo ezonyango, amapolisa, izikolo namancedo ezemidlalo.

Amanyathelo onkunciphisa anenjongo yokwenza izibonelelo ezaneleyo zezibonelelo zokusebenza zentlalo namancedo malunga nokukhula kwenani labantu.

Impembelelo kuvakalelo lwendawo

Isikhululo samandla senyukliya esicetywayo kunokwenzeka sibenesiphumo esitshintsha uvakalelo lwendawo yengingqi.

Le nkxalabo inxulumene nokuthi kunokwenzeka ukuba isikhululo samandla senyukliya singaba negalelo elingalunganga kwiimpawu zangoku, okanye uluvo / imbono abantu abakholelwa kuyo. Abahlali banamava okuba indawo yabo ikhethekile yaye inophawu olulodwa.

Amanyathelo okunciphisa anenjongo yokuthintela iziphumo ezingalunganga nokuphazamiseka kovakalelo lwendawo, elo iprojekthi inokuba nalo kokusingqongileyo.

Ukusetyenziswa koMhlaba kwiXesha elizayo (Ukucwangcisa)

Isikhululo samandla senyukliya esicetywayo siya kuba nempembelelo ekusebenziseni umhlaba kwixesha elizayo nokucwangcisa kummandla. Amanyathelo okunciphisa anenjongo yokunciphisa impembelelo yesikhululo samandla senyukliya ekusetyenzisweni komhlaba nokucwangcisa kwixesha elizayo.

Iingozi eziBonwayo ziYamene neziGaneko zeNyukliya

Ngexesha lenkqubo yokubonisana noluntu, kuxeliwe ngokucacileyo ngabathathinxaxheba abahlukahlukeneyo ukuba bayayoyika impembelelo yeengozi ezinokubakhona ezinxulumene neziganeko zenyukliya. Ezi ngozi zinxulumene nezinto ezilandelayo:

- Ukhuselelo loyilo;
- Iingozi zenyukliya;
- Izenzo zobugrogrisi ezinokwenzeka;
- Isakhono nobuchule babantu abaqhuba isikhululo samandla senyukliya;
- Iintshukumo zoqhankqalazo noqhushululu lwabasebenzi oluchaphazela ulawulo lwemihla ngemihla; kunye
- Nokuthembeka konikezelwano loqhagamshelwano ngokubhekiselele kwimbono yeengozi ezinokubakhona neempembelelo ezingalunganga kwimpilontle yabantu.

Amanyathelo okunciphisa anenjongo yokuqinisekisa ukuba abahlali bafumana ulwazi oluchanekileyo noluthembekileyo malunga neengozi zokwenene nezibonwayo zamandla enyukliya.

1.18 Sokubonwayo (Appendix E19)

UEskom uzimisele ukwakha izikhululo zamandla zenyukliya kwiziza zonke ezithathu. Isiza esinye siselunxwemeni kumhlaba ophakamileyo othe thu elwandle owaziwa njengeThyspunt phakathi kweOyster Bay neCape St. Francis, malunga nama-70 km kumzantsi-mpuma wePort Elizabeth (eBhayi). Isiza sesibini sikufuphi neBantamsklip phakathi kwePearly Beach neQuoin Point kumzantsi-ntshona wonxweme lwaseKapa

empuma kwiGansbaai yaye esesithathu yiDuynefontein esikumntla wesiKhululo saMandla seNyukliya saseKoeberg (NPS), kwintshona Dolophu yeAtlantis kuNxweme lwaseNtshona Koloni.

Le ngxelo ixabisa impembelelo enokubakho yembonakalo yesiKhululo saMandla seNyukliya kwindalo engqongileyo nemekobume esingqongileyo eguqulwe ngabantu kwisiza ngasinye.

Iimbangi zengozi yembonakalo kuzo zonke iziza ezithathu zinxulumene ikakhulu nokwanda kokuzinyakathisa kwesiKhululo saMandla seNyukliya njengeziko yaye ngokudibeneyo namalungu ancedisayo afana nokwakhiwa kweeofisi, izitora, iindlela zokufikelela, amabala okutshintsha, iintambo zothumelo, iimasti (iipali ezinde) neendawo zokulahla inkunkuma yezinto ezingafunwayo. Kwisiza saseDuynefontein iimbangi zengozi yembonakalo zinxulumene ikakhulu nokuzinyakathisa ngokudibeneyo nesiKhululo saMandla seNyukliya saseKoeberg kufuphi nomda okumazantsi esiza nomatshini ocetywayo wePebble Bed Modular Reactor Demonstration Power Plant kufuphi necala elikumazantsi eKoeberg. Iingozi ezongezelelweyo zesiza ngasinye zichongwe njengokubekwa komthamo omkhulu wezinto ezombiweyo, ukuguqulwa kwemimandla ejikeleze isiza ngexesha lokwakha neendlela ezintsha zokufikelela ngokukodwa kwisiza saseThyspunt.

Isiza ngasinye kuxoxiwe ngaso saza salinganiswa ngokwemigaqo-siseko yembonakalo yokubonakala ezindleleni kwakunye nembonakalo yomhlaba ojikelezileyo ngokubanzi, ukuzinyakathisa okunokubakho kwimbonakalo kuphawu lwembonakalo yomhlaba novakalelo lwendawo nokwayamanisa imbonakalo neentambo zothumelo. Impembelelo yembonakalo yeentambo zothumelo ngumba weEIA ehlukileyo; oko kukuthi iEIA yoThumelo.

Isiza ngasinye sivavanyiwe ngokweseti yemigaqo-siseko yokulinganisa impembelelo yembonakalo yokunyakathisa nokubonakala. Isiphumo sophando sesokuba iNPS yaseThyspunt, iNPS yaseBantamsklip neNPS yaseDuynefontein zinobunzulu bembonakalo yokunyakathisa elinganiswa njengebalulekileyo, ngokukodwa umbono wasebusuku.

Ngokusebenzisa iseti yemigaqo-siseko impembelelo yembonakalo yesinye nesinye seziza zeNPS iyavavanywa.

Isigqibo esifikelelwe sesokuba isiKhululo saMandla seNyukliya saseThyspunt, isiKhululo saMandla seNyukliya saseBantamsklip nesiKhululo saMandla seNyukliya saseDuynefontein ziya kunyanzela impembelelo yembonakalo ebalulekileyo kwimeko yembonakalo ekhoyo nophawu lwesimo sendawo sengingqi kumgama wommandla we-5 km. Iimasti (iipali) zemozulu nerediyo ziya kubonakala ngokucacileyo ngosuku olungenawo amafu ukusuka kubude be-10 km ubuncinane. Isibane esibomvu phezu kwemasti yemozulu eli-120m ukuphakama siya kubonakala ebusuku ngaphaya kwe-10 km. Iimeko zemozulu ziya kuba nefuthe ekubonakaleni kweemasti njengoko iimeko zobukho bamafu okanye inkungu zingawasitha ngokupheleleyo la malungu. Imiba ekhethekileyo yembonakalo enxulumene nesiza yelandelayo:

EThyspunt

Imbonakalo iqulethwe ecaleni kwenxweme lasempuma-ntshona kwimimandla yeendunduma. Oku kuthintela ukuba sesichengeni kwembonakalo yeNPS yaseThyspunt kwiidolophu zeOyster Bay neCape St. Francis.

Umba ongamandla okhokelele kwisigqibo esingentla bubukho bembonakalo engamandla yeNPS yaseThyspunt kwakunye neentambo zothumelo nezakhiwo ezayamene naso, apho zonke zibonakala ngokushiyana ukusuka kummandla we-10 km wesiza, kodwa ikakhulu ecaleni komphetho wonxweme. Oku kungenxa yokwakheka komhlaba oquka iindunduma ezinezityalo nezishenxayo ezisinga empuma-ntshona, eziphantse zifane nommandla waselunxwemeni kwakunye nokukhanya okwandisiweyo ebusuku ngenxa yokukhanyiswa okungamandla kweso siza. Nangona kunjalo umbono okhoyo ebusuku waselunxwemeni ngokubanzi uphazanyiswa zizibane ezibukhali ezikhanyayo kumaphenyane ‘echokka’ njengoko eloba izilwanyana zasemanzini ezifana nengwane kufuphi nonxweme. Ubunzulu bokukhanya buyahlukahluka ngokwexesha lonyaka lokuloba ngeechokka. Ukuzinyakathisa kwembonakalo kuphawu lwembonakalo yomhlaba kuya kwandiswa liBala leHV, iintambo zothumelo nendlela yofikelelo ecetywayo kumantla yaye zonke zibonakala ngokuphandle kumhlaba omxinwa odibana nobanzi kwipropati ekumantla endunduma ephakamileyo yentlabathi.

EBantamsklip

Umba ongamandla okhokelele kwisigqibo esingentla bubukho bembonakalo engamandla yeNPS yaseBantamsklip kwakunye neentambo zothumelo nezakhiwo ezayamene naso, apho zonke zibonakala ngokushiyana ukusuka kummandla we-10 km wesiza. Oku kungenxa yokwakheka komhlaba olithambeka ukuya kummandla waselunxwemeni kwakunye nendawo ephumileyo eya ngaselwandle kwisiza kwithambeka lezinyuso laselunxwemeni. Oko kubonakala kuya kwandiswa ebusuku kukukhanyiswa komatshini.

EDuynefontein

Isiphumo sophando sesokuba iNPS yaseDuynefontein inobunzulu bembonakalo yonyakathiso olulinganiswa njengolubalulekileyo, ngokukodwa ebusuku. Oku kungokwayamaniswa nobungakanani bokuba kufutshane kweNPS yaseKoeberg yaye umatshini onokubakho kwixesha elizayo wePebble Bed Modular Reactor Demonstration Power Plant (PBMR DPP) uya kwandisa njengeqela impembelelo ekhoyo yembonakalo yeNPS yaseKoeberg kwimbonakalo yomhlaba nabahlali abayingqongileyo.

Imbonakalo engamandla yeNPS yaseDuynefontein nesibonelelo sokusebenza esayamene nayo ziya kubonakala ngokushiyana ukusuka kumgama wesiza we-10 km. Oku kungenxa yokwakheka komhlaba othambekele ngaselunxwemeni yaye ukukhanya kwandiswa ebusuku kukukhanya kweso siza.

Impembelelo yembonakalo eyongezelekayo yamalungiselelo amathathu amakhulu okuvelisa amandla kumgama we-3 km ukusuka elunxwemeni inokuzinyakathisa okuphezulu kwimbonakalo yeembono, uphawu lwembonakalo nobulunga bembonakalo.

Isikhululo esitsha seOpened Cycle Gas Turbine Power Station sigqityiwe eAtlantis, malunga ne-10 km ngaphakathi kwelizwe ukusuka kwisiza esicetywayo. Oku kongeza esinye isakhiwo somlinganiso omkhulu kwimbonakalo yomhlaba wenqila.

Izakhiwo ezincedisayo neempawu nazo zivavanyiwe malunga nefuthe lazo kwimbonakalo yovakalelo lwendawo nokuzinyakathisa kwembonakalo yazo. La malungu ziimasti (iipali) zemozulu (120m) neemasti zerediyo (95m), iintambo zothumelo phakathi kwepaseji ye-EIA, iindawo zokulahla inkunkuma yezinto ezingafunwayo namadwala neendlela zokufikelela kwisiza ukususka kwindlela yephondo.

Iziphumo zophando zezi

- iimasti ziza kubonakala ukususka kumgama omde kuneNPS, ngokukodwa ebusuku, ngenxa yesibane esibomvu esidanyazayo kumphezulu. Imasti iya kucutheka, nto leyo eya kunciphisa ukuzinyakathisa kwayo kwimbonakalo;
- iintambo zothumelo phakathi kwepaseji ye-EIA ziya kongeza ukuzinyakathisa kwimbonakalo yeprojekthi ngokuphakama nenani lazo;
- iindlela zokufikelela zaseBantamsklip naseDuynefontein ziya kuba nokuzinyakathisa kwimbonakalo yovakalelo lwendawo ngokungenamsebenzi;
- iindlela zaseThyspunt ziya kuba neyona mpembelelo ingalunganga kuvakalelo lwendawo, apho indlela esemantla ichongwe njengeyona inempembelelo encinci engalunganga ngenxa yembonakalo edibene neentambo zothumelo ezibonakala kakhulu, iintambo ezi-2 x 400kV eziphumayo nentambo e-1 x 132kV engenayo, kwakunye neBala leHV;
- iindawo zokulahla inkunkuma yezinto ezingafunwayo zinkulu kakhulu yaye kucingwa ukuba zibekwe phakathi kwepaseji yeEIA. Le ndawo iya kwenza ukuba iindawo zenkunkuma zibonakale ngamandla phakathi kommandla yaye zingasebenza njengezikhuselo ezikhulu zembonakalo zeNPS ukususka kwiindlela zephondo.

Kucetywa amanyathelo alandelayo esiQhelo sokuNciphisa ngenjongo yokuphungula impembelelo yembonakalo yeNPS.

Kucetywa amanyathelo alandelayo esiQhelo sokuNciphisa ngenjongo yokuphungula impembelelo yembonakalo yeNPS.

Umbala

Kukhuthazwa ukuba kusetyenziswe umbala wobublowu obungwevu obukhanyayo kwizakhiwo ezikhulu (oko kukuthi iSakhiwo seTurbine-Generator), netshimini enobungwevu obukhanya kakhulu. INPS sisakhiwo sekonkriti, eya kuba nobungwevu obukhanyayo. Ibhanti elintsundu ukujikeleza izakhiwo ezinkulu liya kunciphisa umlinganiso wazo othe nkqo. Iimasti kufuneka zibe nombala ongwevu oya kuba sisiphumo sokupeyintwa kwazo. Nangona kunjalo oku kunokuchasana neemfuneko zolawulo zokuba zibe namabhanti abomvu namhlophe.

Izikhuselo

Izikhuselo zethutyana zemo yelaphu kwiindawo zokubiyela ukujikeleza isiza sokwakha, iindawo zokusebenza neendawo zokuseka kufuneka zisetyenziswe ukuthintela iimbono zamalungu amaninzi okwakha kumphakamo wokubiya.

Iindledlana zomhlaba zobukhulu obubonakalayo kufuneka ziyilwe ecaleni komda wesiza owona ukufutshane nomhlaba wemisebenzi enovakalelo, umz. iindawo zokuhlala neendlela, ukukhusela iinxalenye ezithile zezakhiwo. Nangona kunjalo, kufuneka

kuthathelwe ingqalelo iimpembelelo ezayamene nazo ezidalwayo ngexesha lokwakhiwa nokuzinziswa kwazo, ezifana nothuli, nengxolo, ukubuyisela kwimo yesiqhelo nokutshabalalisa izihluma ezikhoyo zaselunxwemeni. Uvavanyo olunzulu kufuneka luqhutywe kwisiza phambi kokuba kuthathwe nasiphi isigqibo malunga nesikhuselo sendledlana. Oku kuyimfuneko ngokomxholo wokusetyenziswa okunokubakho komhlaba weendawo zokuhlala kummandla waselunxwemeni okwimpuma yesiza seNPS yaseThyspunt nasentshona yeCape St. Francis, kwakunye nasempuma yeNPS yaseBantamsklip, enokuba sisiphumo sokwandiswa kweR43 ukuyidibanisa neBredasdorp.

Ukukhanya

Ukukhanya kwezakhiwo neendawo ezingaphakathi kwesiza seNPS kufuneka kuyilwe ngumntu onamava afanelekileyo ngenjongo yokunciphisa “ukuphalala kokukhanya”. Imiba ekufuneka ifakelelwe kukukhanyisa phantsi, umbala wokukhanyisa, umgama ofunekayo wokukhanyiswa, izifakelelo zezibane ezilawula ukukhanya nokunciphisa intsusa yokukhanya okubonakalayo.

Iindawo zokulahla inkunkuma yezinto ezingafunwayo

Iindawo ezinkulu zokulahla inkunkuma yezinto ezingafunwayo kufuneka zidityaniswe nemo yendawo ekhethiweyo ngokutshintsha imo yazo namathambeka asemacaleni ukulingana umlinganiso weentlobo zomhlaba ezikhoyo. Ngaphezu koko ukutyalwa kwakhona kweentlobo zezityalo zelizwe ngokwenene zokwakheka komhlaba ongqongileyo kuyimfuneko ukuyila imbonakalo ehambelana namalungu endawo yokulahla inkunkuma nophawu olukhoyo lokwakheka komhlaba.

IGcisa lezakhiwo Lokwakheka komhlaba kufuneka lalathelwe kwiqela lokuyila ngenjongo yokucebisa ngokudibanisa imbonakalo yeprojekthi kwizinga elinzulu ngexesha lezigaba zokuyila nokwakha nokusebenza.

Ingxaki yokubeka isibonelelo esitsha somlinganiso omkhulu kummandla ongekaphazanyiswa kangako nosemaphandleni okanye kufuphi neendawo ezakhiweyo yokunciphisa ubunzulu bokuzinyakathisa kwimbonakalo isekhona. Umbuzo ngowokuba kwandiswe, kodwa kuqukwe impembelelo yembonakalo kwingingqi okanye kwenziwe impembelelo yembonakalo kwenye indawo (esele inempembelelo), kodwa hayi ngomgangatho ofanayo.

Isigqibo sesokuba iNPS kuso nasiphi seziza ezintathu iya kuba nempembelelo yembonakalo ephezulu kuphawu novakalelo lwendawo lwemo yendawo ekhoyo. Nangona kunjalo, ngengqalelo kwimiba enzulu yamanyathelo okunciphisa acetywayo, iimpembelelo zembonakalo zingaphungulwa. Ukufikelela oku, umzamo omkhulu kuya kufuneka usetyenziwe kulo mba ngexesha lokuyila isiza nebakala lokwakha leprojekthi.

1.19 UHlolo lweeMpembelelo zeeNdawo zaMafa (Appendix E20)

I-Ofisi yeeKontraki yophando ngeMbali yabaNtu kuDala oko kuSenziwa ngokuMbiwa yeYunivesiti yaseKapa (ACO) yaqeshwa yi-Arcus Gibb (Pty) Ltd egameni le-Eskom Holdings ukuba iqalise icandelo lezamafa lohlolo lweempembelelo zokusingqongileyo kwiziza ezicetywayo ezithathu zama-4 000 MW zesikhululo samandla senyukliya kunye nezakhiwo ezinxulumeneyo. Ugunyaziso lufunelwa esinye sezi ziza zithathu. Iziza zimi

kwiNtshona neMpuma yeKoloni, i-Duynefontein ikufutshane nesikhululo samandla senyukliya esikhoyo (eNtshona Koloni), esesibini sise-Bantamsklip phakathi kwe-Pearly Beach ne-Die Dam (eNtshona Koloni) esesithathu e-Thyspunt phakathi kwe-Cape St. Francis ne-Oyster Bay eMpuma Koloni. Olu phononongo, olubandakanya imvelaphi ebanzi nophando olungundoqo olulandelwa luhlolo kummandla, luchonge ubuthathaka kumafa kuzo zozithathu iziza.

Zozithathu ezi ziza ziqulethe imithombo ebalulekileyo yamafa, ekwiindawo ezaziwayo ezinobuthathaka benzululwazi yembali zokwembiwayo kwakudala nenzululwazi yezidalwa zamandulo, kwimimandla enembonakalo yelizwe eneempawu ezingamandla zasendle. Ezi zinto zifunyanisiweyo kuphando, zishwanakathelwa ngale ndlela:

E-Duynefontein:

- Iimpembelelo zexeshana zamafa esizwe eMinyaka yaMva yaMatye (Late Stone Age) ziya kuba ncinci.
- I-Duynefontein inobuthathaka obuphezulu ngokwezidalwa zamandulo. Unciphiso olubanzi luya kufuneka apho, ukuba lwenziwe ngokufanelekileyo, luya kunceda uphando ngezidalwa zamandulo.
- Ngokwembonakalo-mhlaba yenkcubeko ubukho boshishino lwenyukliya sebusekiwe yaye bamkelwe njengebhakana luninzi lwabahlali baseKapa. Naziphi na izinto ezongeziweyo koku ziya kongezwa kwiziko elisele lisekiwe.

I-Bantamsklip:

- Ngokwemigangatho yaseNtshona Koloni ulondolozo nomthamo weziza zezinto zakudala ezombiwayo ubalasele. Unciphiso olubanzi luya kufuneka.
- Iimbonakalo-mhlaba zendawo zamafa esizwe endalo zibalasele yaye zenza igalelo kwindawo kummandla. Zikunye nezinto zezifundo zakudala zimele imbonakalo-mhlaba elungileyo ngokubanzi yamaxesha aphambi kokusekwa kwamathanga (precolonial). Kuthathelwa ingqalelo ubunzima nobuninzi bomsebenzi ocetywayo zilindelwe iimpembelelo zembonakalo-mhlaba zenkcubeko ezingeke zincitshiswe.

I-Thyspunt:

- Amafa ezinto zakudala ezimbiwayo nezidalwa zamandulo eziziintlobo ngeentlobo aye anda kakhulu kodwa aphathelene nemimandla yejografi – ingakumbi iThafa leeNgqumba zeNtlabathi lase-Oyster Bay kunye nakuma-300 eemitha zendawo yokuphakama kwamanzi. Ukonyuka kumgama wokubuyisela emva kunxweme ukusuka kuma-60 eemitha ukusuka kwindawo ephezulu yamanzi ukuya kuma-200 eemitha kuye kwehlisa ngokubonakalayo iimpembelelo kwiziza zeembali zezinto zakudala ezembiwayo. Ngenxa yokufunyanisiweyo kumaphando abanzi, kuqukwa nenkqubo yolingo yokwemba, kusenokwenzeka ukubeka isikhundla samandla senyukliya esicetywayo ngendlela yokuba iimpembelelo ezibonakalayo kwiziza zamafa zembali yezinto zakudala ezembiwayo zincitshiswe. Ukuncitshiswa kwayo nayiphi na imathiriyeli yamafa ngokuthathwa kwesampuli ngokwemba okulawulwayo, okanye ukusekwa kwemimandla yokukhuphela ngaphandle ithathwa ngokuba inokwenzeka ngemithombo efumanekayo owkangoku. Enye indawo yokugcina yesiza (imyuziyam encinane) inokuba yimfuneko. Iimpawu zasendle zale nxenye yonxweme ngokudibana namafa ezinto zakudala ezembiwayo zibalasele kwaye zenza igalelo ngokubonakalayo kwisimo sommandla. Kuthathelwa ingqalelo ubunzima nobuninzi bomsebenzi ocetywayo zilindelwe iimpembelelo zembonakalo-mhlaba zenkcubeko ezingeke zincitshiswe.

1.20 Uvavanyo Lwempembelelo Yezolimo (Appendix E21)

Uphando oluqhutywe kumgama weradiyasi ye-16km yazo zozithathu iziza lubonise ukuba ulimo kummandla weThyspunt lusekelwe kwimveliso yobisi; ifynbos ixhaphake kakhulu kummandla waseBantamsklip nangona zikhona iideri ezithile kwakunye neefama zeenkomo zenyama, zeegusha nezezilwanyana ezizingelwayo; xa ummandla waseDuynefontein usekelwe kubufama obuxubileyo.

Ngokuya ngolwazi oluqokelelweyo kuphononongo lwezolimo, kuqikelelwe ukuba ixabiso langoku lonyaka lwemveliso yeefama ngowama-2008 belingange-R150 yezigidi kummandla waseThyspunt, lingama-R29 ezigidi eBantamsklip yaye lingama-R75 ezigidi eDuynefontein.

Iimpembelelo ezingamandla zesikhululo samandla senyukliya kulimo bezinokuba kukuveliswa kothuli ngexesha lesigaba sokwakha, ukunqongophala kwabasebenzi nokwenyuka kwemivuzo, neziphumo zemalike. Impembelelo eqikelelweyo kwiimalike zemveliso ibonise ukuba ixabiso lilonke lemveliso kummandla waseBantamsklip ***belingaba nako*** ukunyuka nge- 5% yaye kummandla waseThyspunt nge-10 ukuya kwi-15%, xa kungekho nguqu ilindelweyo kummandla waseDuynefontein.

Ngokwembono yemveliso yezolimo iDuynefontein sisiza esikhulileyo ngenxa yokuba imveliso yomdiliya nengqolowa ziqhubile ecaleni kwezigaba zokwakha nezokusebenza zesikhululo saMandla seNyukliya esiseKoeberg. Uthuli ngexesha lokwakha umatshini omtsha luya kuba nesiphumo esincinci kwimihlaba yeefama ngenxa yokuba imimoya ezingisayo ngexesha leenyanga ezomileyo zasehlotyeni ihamba ecaleni komcu waselunxwemeni.

Ukushwankathela, iimpembelelo kulimo kwiziza ezithathu zingendlela elandelayo:

EDuynefontein

- Ayikho impembelelo ebalulekileyo kwezolimo ngexesha lokwakha nelemisebenzi eqhelekileyo. Akukho ukwanda kwemveliso yezolimo ngexesha lokusebenza.

EThyspunt

- ***ngexesha elifutshane*** impembelelo engalunganga kwezolimo ingabakho ngenxa yothuli ngexesha lesigaba sokwakha. Nangona kunjalo likho ithuba lempembelelo elungileyo kummandla kwimveliso ngokwandisa ubukhulu bemalike yengingqi ngenxa yokungena ngamandla kwabemi (Abaqeshwa kwiNyukliya-1 neentsapho zabo kwakunye nabasebenzi bokwakha).

EBantamsklip

- ***ixesha elifutshane*** impembelelo engalunganga kwimveliso yezolimo iphathelele kuthuli ngexesha lesigaba sokwakha. Kukho ithuba eliqikelelwayo lokukhula okunganeno kwe-5% kwimalike yengingqi yemveliso yezolimo ngenxa yezithintelo zamanzi ezithintela ukwanda.

Ngokwempembelelo kwezolimo azikho iziphene ezibulalayo ngokuphathelele nasiphi nakwiziza ezithathu, yaye zonke zingafaneleka ukuhlalisa iNyukliya-1.

1.21 Sokhenketho (Appendix E22)

Olu phononongo luxabisa ishishini lokhenketho kwesinye nesinye seziza ezintathu ezichazwe kwinkqubo kaEskom yeNyukliya-1, oko kukuthi, iThyspunt, iBantamsklip neDuynefontein. Imalike yokhenketho kwisiza ngasinye ichaziwe yavavanywa kwimimiselo elandelayo:

- Inkcazo yemeko yeli xesha (status quo) ngokweshishini lokhenketho ngoku namagqabantshintshi ophuhliso olucetywayo kummandla ngamnye
- Inkcazelo nexabiso lenguqu kwimpahla yokhenketho enokwenzeka ngenxa yokwakha nokusebenza kwesikhululo samandla senyukliya kummandla ngamnye
- Ukuchonga nokukhuthaza amanyathelo okunciphisa ngenjongo yokuphungula okanye ukubuyekeza iimpembelelo ezingalunganga ezibonwayo kwimpahla yokhenketho

Isiza ngasinye siphandiwe ngophononongo lwekhompyutha olunzulu olulandelwe lutyelelo lommandla. Iintlobo ngeentlobo zabantu abachaphazelekayo neziphatha-mandla eziphambili kukhenketho bachongiwe, kwaqhagamshelwana nabo yaye kwaqhutywa udliwano-ndlebe nabo. Ukuba mbaxa kweshishini lokhenketho lilonke nefuthe elitshintshayo lembono nomfanekiso ekuthengiseni ukhenketho, ukubalula indawo ekusingwa kuyo nokwenza izigqibo, kwenza kube nzima ukuxabisa umndilili wokhenketho. Ngako oko kuthathwe isigqibo sokuba eyona ndlela ilungileyo yokubonisa ukusebenza kokhenketho neyona ndlela ilungileyo yokuthelekisa ixabiso lerandi kummandla ngamnye inokuba lixabiso leendawo zokulala ezicithwe apho. Oku kubalelwa ummandla ngamnye wophando ngokubala inani elisondeleyo leebhedi liphindaphindwe ngomndilili wokuhlalwa ngonyaka kuphindaphindwa ngomndilili wexabiso ngobusuku.

Impahla yokhenketho kummandla ngamnye yachazwa ngokwengqwalaselo yengcali neembono zabantu abachaphazelekayo ekubonisenwe nabo. Emva kophengululo lwedata yommandla yingcali, kubunjwe isikali esinemilinganiso yeempembelelo zokhenketho namaxabiso onyaka abonisa iimpembelelo kukhenketho abalwa kusetyenziswa izibalo zebhedi ngobusuku. Isishwankathelo sibonisiwe kuluhlu olungezantsi.

		IsiGaba soKwakha (iminyaka 1-6)		IsiGaba sokuSebenza (iminyaka 7-20)	
	Ixabiso loKhenketho Ngoku (iiRandi)	Impembelelo ngoNyaka (iiRandi)	Impembelel o (%)	Impembelelo ngoNyaka (iiRandi)	Impembelel o (%)
EDuynefontein	497,827,951	0	0.00%	7,111,828	1.43%
EBantamsklip	62,247,100	3,112,355	5.00%	5,335,466	8.57%
EThyspunt	77,745,000	-6,108,536	-7.86%	0	0.00%

Abahlali baseThyspunt naseBantamsklip bavakalise eyona nkcaso ingagungqiyo kwisikhululo samandla senyukliya. IThyspunt iqaqambise ngokucacileyo imo ephambili yendawo ephambili eselunxwemeni yokuchitha ikhefu, ukanti iBantamsklip igxininise imo entsha nenkenenkene yophuhliso lwemveliso yokhenketho nokuthembela kwengingqi kuyo. Umahluko kubukhulu nohlobo lokhenketho kwezi ziza ezibini kuchaza ukuba kutheni impembelelo yexesha elifutshane eThyspunt ibonwa ingalunganga; ilahleko

ethile yemalike yangoku yeeholide kunokwenzeka ingabuyekezwa ngokupheleleyo luhlumo lweshishini lokhenketho eThyspunt, ukanti ishishini lokhenketho kunokwenzeka landise ubukhulu bemalike encinci yaseBantamsklip. Xa abanye abantu baseDuynefontein abachaphazekelayo kukhenketho beneenkcaso zobuqu ekwakhiweni nokusebenza kwesikhululo samandla senyukliya esinye, bayaliqonda ithuba lokwanda kweshishini yaye bakhuthaza ngokubanzi imbonakalo elungileyo yokhenketho.

Inyathelo elingamandla lonciphiso liphulo elihlaselayo elisekwe kunxibelelwano oluqukayo loluntu lokujongana neenkolelo eziqhelekileyo eziphosakeleyo, ngokukodwa iimpembelelo zokuvelisa amandla ngenyukliya kwimekobume esingqongileyo yolwandle nekufuphi. Umdibaniso ochaziweyo nobanzi weearhente ezifanelekileyo zokhenketho nemibutho kwiinjongo nemisebenzi kaEskom yenyukliya kwisiza ngasinye, uya kulungiselela kwangexesha iinguqu zokuthengisa indawo yotyelelo nokubalula imizamo yokhenketho, yaye ngako oko ikhawulezise ukuqhelisa iimveliso zokhenketho zesiza ngasinye nomfanekiso wendawo ukusingisa kwimekobume entsha enokubakho yenyukliya; njengoko kugxininisiwe lungenelelo lorhwebo nenkxaso yabachaphazelekayo efunyanelwe iNPS yaseKoeberg.

Ukushwankathela, iimpembelelo kukhenketho kwiziza ezithathu zezilandelayo:

- EDuynefontein – zamkelwe lula kakhulu kuqoqosho lwengingqi; ayikho impembelelo yexesha elifutshane ebonakalayo kukhenketho; kumgangatho omncinci, impembelelo elungileyo yexesha elide ebonakalayo kukhenketho;
- EBantamsklip – umgangatho omncinci, impembelelo elungileyo yexesha elifutshane nelide ebonakalayo kukhenketho;
- EThyspunt – umgangatho omncinci, ixesha elifutshane, impembelelo engalunganga ebonakalayo kukhenketho; ayikho impembelelo equkayo yexesha elide ebonakalayo kukhenketho.

Ngokwempembelelo kukhenketho, akukho ziphene zibulalayo ngokuphathelele nasiphi seziza ezithathu, zonke zingalungela ukwamkela iNyukliya-1.

1.22 Sengxolo (Appendix E23)

Iingcali ziye zaphonononga impembelelo enokubakho yengxolo ebangelwa kukusekwa okucetywayo kweSikhululo saMandla seNyukliya (iNyukliya-1), ngokuvelisa umbane womthamo wobona bukhulu bungama-4 000 MW, kwiindawo ezintathu ezahlukeneyo. Iindawo ezintathu ziseKoeberg (iDuynefontein) isiza esisemantla ngqo kwiSikhululo saMandla seNyukliya saseKoeberg (KNPS), eNtshona Koloni; iBantamsklip malunga ne-5 khilomitha empuma kwePearly Beach, eNtshona Koloni; naseThyspunt, empuma kweOyster Bay, eMpuma Koloni.

Ibingekho inkcazelo (iinkcukacha) efumanekayo yobungakanani bengxolo ekhutshwa ngoomatshini nezixhobo zokusebenza eziza kufakelwa kwisiza. Le nkcazelo, ekhutshwawa ngabenzi boomatshini/izixhobo ngokwahlukahlukana kwazo, idla ngokufumaneka kuphela kwisiniki-maxabiso (tender) nakwinqanaba loyilo olunzulu bakuba abenzi noomatshini/izixhobo bekhethiwe.

Amandla ombane awona mthamo mkhulu ungama-4 000 MW weNyukliya-1 uya kuba mkhulu ngokuphindwe ka-2,2 kulowo oli-1 800 MW weSikhululo saMandla seNyukliya saseKoeberg esikhoyo (KNPS). Kucacisiwe kule ngxelo ukuthi, ukuba bekunokubakho

ukwanda kwamandla esandi esikhutshwayo (ngeewatt) esiyameneyo esiphindwa ka-2,2, esi sandi besingenakuvakala ebantwini. Umahluko onjalo ugqalwa ungabalulekanga kwimigangatho yesizwe neyezizwe ngezizwe enxulumene nokuvavanya ingxolo kokusingqongileyo. Ngako oko, kuye kwamkelwa ukusebenzisa iziphumo zemilinganiselo enzulu yesandi eqhutywe kwiKNPS ukubala ubungakanani bamazinga engxolo kumhlaba ojikeleze iNyukliya-1 ecetywayo kwiziza ezithathu ngokutshintshanayo. Oku kubonelele ngeyona nkcazelo ilungileyo ifumanekayo yokuqikelela impembelelo yengxolo enokubakho evela kwisikhululo samandla esicetywayo seNyukliya-1.

Iziphumo zophononongo zibonise ukuba ayinakubakho impembelelo yengxolo kumhlaba ojikeleze nayiphi na kwiipropati ezintathu ngexesha lokwakha nokusebenza kwesikhululo samandla senyukliya esicetywayo. Ngako oko azikho iinkqubo zokunciphisa ingxolo eziya kufuneka. Ingxolo ngexesha lesigaba sokusebenza ayinakuba nonxulumano kukhetho lwesiza nasiphi kwiziza ezithathu ezitshintshanayo.

Ayikho impembelelo yengxolo elindelweyo eyayanyaniswa nokwakhiwa kweendlela ezintsha ukuya kwiziza ezitshintshanayo, ngaphandle kwendlela yokufikelela yasentshona kwesiza saseThyspunt eya kudlula kwisithuba sama-230 m selokishi Umzamowethu. Kumzekelo wokugqibela kwenziwa kukhuthazwe oku kulandelayo:

- Kusetyenziswa iinkqubo zokwakha noomatshini/izixhobo zokusebenza ezikhupha awona mazinga aphantsi engxolo afumanekayo;
- Inkqubo ecwangciswe neququzelelwe kakuhle “yokukhawulezisa” iyaphunyezwa ukugqiba iyonke inkqubo yokwakha ngelona xesha lifutshane linokuthathwa; yaye
- Umsebenzi wokwakha kufuphi neendawo zokuhlala wenziwa kuphela ngamaxesha aqhelekileyo asemini omsebenzi.

Impembelelo yengxolo eyayanyaniswa nokuthuthwa kweempahla nezixhobo zokusebenza ukuya kwisiza inokuba nempembelelo ephantsi kwezona zindlu zokuhlala zikufutshane nendlela u-R27 eya kwisiza saseDuynefontein. Impembelelo yengxolo kwezona zindlu zokuhlala zikufutshane ecaleni kwendlela u-R43 eya kwisiza saseBantamsklip inokuba phakathi. Impembelelo yengxolo kwinani elincinci lezindlu zokuhlala kweyona ndawo ikufutshane yeendawo zokuhlala ezingekho sikweni ecaleni kwendlela u-R330 kulwandle iVista kufuphi nesiza saseThyspunt inokuba phakathi. Kuyo yonke imizekelo, alukho unciphiso lwengxolo oluya kufuneka ngokweMimiselo yoLawulo lweNgxolo/Noise Control Regulations (NCR).

Ukuthuthwa koomatshini abanzima kwizithuthi zobunzima obugqithisileyo ezicothayo kwiindlela ezikumgama we-1000 m wezindlu zokuhlala, kungenzeka kube nesiphumo sempembelelo yengxolo yobunzulu obuphakathi kodwa okwexesha elifutshane kakhulu. Kuncinci okunokwenziwa ukunciphisa amazinga engxolo akhutshwa zizithuthi zobunzima obugqithisileyo. Ngenjongo yokunciphisa impembelelo yengxolo kubahlali abachaphazelekayo, kukhuthazwa ukuba baziswe kwangaphambili kokuthuthwa nakuphi okwenzekayo.

1.23 UHlolo lomNgcipheko weMpilo yabaNtu (Appendix E24)

Iprojekthi ye-Eskom yeNyukliya-1 ibandakanya ukunikwa kwemvume kweziza ezithathu ngakumanxwebe entshona kunye nomzantsi oMzantsi Afrika ekwakhiweni kwezikhululo zamandla enyukliya. Iziza zezi:

- Isiza sase-Thyspunt, esimi kwiPhondo leMpuma Koloni kummandla wentshona yeBhayi phakathi kwe-Cape St. Francis ne-Oyster Bay;
- Isiza sase-Bantamsklip, esimi eNtshona Koloni kummandla ophakathi kwe-Danger Point ne-Quoin Point; kwaye
- Isiza sase-Duynefontein, esimi kuNxweme lweNtshona yeKoloni, malunga nama-30 eekhilomitha ukusuka eKapa, soyamene neSikhululo saMandla eNyukliya sase-Koeberg sangoku.

Ukwakhiwa kwesikhululo samandla enyukliya siquka imisebenzi emininzi, efuna ugunyaziso ngokweMimiselo yoHlolo lweMpembelelo zokusiNgqongileyo (Environmental Impact Assessment) (EIA) ezibhengezwe phantsi komThetho woLawulo lokusiNgqongileyo weSizwe (oyiNombolo ye-107 ka-1998), njengoko utshintshiwe. Inkqubo ye-EIA ilawulwa liSebe leMicimbi yokusiNgqongileyo (Department of Environmental Affairs) (DEA). Nakuba kunjalo, kulandela isivumelwano sentsebenziswano phakathi kwe-DEA kunye noMlawuli weNyukliya weSizwe (National Nuclear Regulator) (NNR), kwaye kwavunyelwana ukuba i-NNR iza kuba ngugunyaziwe onoxanduva ngokuphathelene nayo yonke imicimbi enxulumene neempembelelo zokuguqula utshiso ngemitha kwimpilo yabantu. Ingxelo zempembelelo zokusingqongileyo kuhlolo lwemingcipheko yempilo enokuba khona enxulunyaniswa nezikhululo zamandla enyukliya kwiindawo ezonyuliweyo iza kungeniswa kwi-NNR ukuze ivunywe. Ingxelo ilungiswe yi-INFOTOX (Pty) Ltd idibene ne-SRK Consulting.

Ukhuselo lotshiso ngemitha kuluhlu lwethamo elisezantsi undoqo lukhuselo kumhalza obangwe lutsjiso ngemitha kunye nesifo esinokufuzwa. Ezi ziphumo zitolikwa njengezinepateni enokutolikwa ngokweenkcukacha manani, bungekho ubukhulu ekufuneka budlulwe, kwaye ukwenzeka rhoqo kunokwenyuka ngokomlinganiselo wethamo lotshiso ngemitha. Ukuba sesichengeni kutshiso ngemitha kuboniswe ukuba konyusa umngcipheko wezinye izifo, ingakumbi izifo ezinxulumene nentliziyo, kubantu abasesichengeni kakhulu kumathamo aphezulu otshiso ngemitha, njengakunyango olutshisa ngemitha kunye nakumaxhoba eziqhushumbisi ze-atom aye akakhuseleka kumathamo aphezulu otshiso ngemitha. Nakuba kunjalo, abukho ubungqina obungqalileyo bomngcipheko owonyukileyo wezifo ezingezizo ezomhlaza ngamathamo angaphantsi kwe-100 millisieverts (mSv). Eli nqanaba lethamo yimiyalelo emibini yobukhulu obungaphezulu kumda wethamo le-NNR ekubeni sesichengeni koluntu. Ukhuselo ngokubhekisele ekuveleni komhlaza ovela kutshiso ngemitha luthathwa ngokuba lwanele kukhuselo olubhekisele kwiziphumo zofuzo kunye nazo naziphi na ezinye izifo ezinxulumene notshiso ngemitha.

Abantu basesichengeni yonke imihla kutshiso lwemitha olukhoyo lwendalo oluvela kumhlaba wokusingqongileyo, umoya, ukutya, amasuntswana ahamba esithubeni ngesantya sokukhanya, kunye navela kokusebenzayo okutshisa ngemitha emzimbeni womntu. Ayikho ipropati jikelele eyenza iziphumpo zotshiso ngemitha olwenziwe olohlukileyo kolo tshiso ngemitha lwenzeka ngendalo.

KwiSaziso sikaRhulumente esiyoiNombolo R. 388, iSebe lezeMbiwa namandla *laxela umda wethamo elisebenzayo lonyaka le-1 mSv kumalungu oluntu kuyo yonke imisebenzi egunyazisiweyo****. Umda wethamo uthetha "ixabiso lethamo elisebenzayo***

okanye ithamo elilinganayo ebantwini kwimisebenzi egunyaziswe yimvume yokufakwa kwenyukliya, imvume yokufakwa komgqomo wenyukliya okanye isitifiketi sokubhalisa, ekufuneka ungedlulwa".

Ukongeza, i-NNR imisela umqobo wethamo we-0,25 mSv osebenzayo kumsebenzi ogunyazisiweyo, ukuqinisekisa amanye amathamo afunyenwe lilungu eliphakathi leqela elisengozini kuyo yonke imithombo elawulwayo liya kuba lincinane kunomda wethamo. Imiqobo yethamo "lunyino olulindelweyo nolunxulumene nomthombo kwithamo lomntu elivela ***kumsebenzi oxelwe kwangaphambili womsebenzi ogunyazisiweyo osebenza ngokukhethekileyo njengomda ekunyusweni kokhuselo lotshiso ngemitha nokhuseleko lwenyukliya****".*

I-NNR ifuna ukuba nakuphi na ukuba sesichengeni okungaphezulu kotshiso lwemitha lwesiqhelo lwendalo kufuneka kugcinwe kusezantsi kangangoko kufanelekile (umthetho-siseko we-ALARA). Imida yethamo kune enemiqobo yethamo kufuneka zihlale zitolikwa njengemida ephezulu idibene nomthetho-siseko we-ALARA, kugqitywa ekubeni ukuba sesichengeni okuvela kwimisebenzi egunyazisiweyo xa kusetyenzwa kunokuba sezantsi kunemida yethamo kunye nemiqobo yethamo.

Ubuchwepheshe bebesixhobo sombane abukakhethwa kwiprojekthi yeNyukliya -1 ngeli xesha kwaye uhlolo lwangoku lusekelwe kumba we-technology envelope (TE), emisela umda ophezulu wokukhutshwa kotshiso ngemitha, obufuna ukuba amathamo otshiso ngemitha kwilungu eliphakathi leqela elingakhuselekanga kuso nasiphi na kwiziza eliphantsi kokuthathelwa ingqalelo lingodluli kwiimfuno zolawulo lwe-NNR. Ekwenziweni kwamandla ombane okukhethekileyo kwisiza, indibaniselwano yezixhobo ezivelisa umbane inokuthathelwa ingqalelo, ukuba nje ukukhutshwa kotshiso ngemitha kunokudlula i-TE. Uhlolo lweempembelelo kwimpilo oluthiwe thaca kule ngxelo lusekelwe kwinhxelo yangaphambili yokuba i-NNR iza kukhupha imvume kwisiza kuphela ukuba ukuthotyelwa okupheleleyo kweemfuneko zolawulo kubonisiwe. Oku kuya kuthathela ingqalelo hayi kuphela uhlolo lwethamo lotshiso ngemitha kumsebenzi oqhelekileyo wesikhululo samandla enyukliya, oluya kungeniswa kwi-NNR ngohlobo lwengxelo yokukhuseleka kwesiza (site safety report) (SSR), kodwa onke amanye amaphononongo afunekayo kuhlolo lwemeko yokhuseleko xa iyonke.

Ingxelo yeempembelelo zokusingqongileyo ixela iindlela zokulinganisa ukuba sesichengeni kutshiso ngemitha kwaye yenza kusebenze iimfuneko zolawulo ze-NNR ngokuphathelene neengozi ezinokuba khona kwimpilo yomntu. Indlela le ithathela ingqalelo imizekeliso engqalene neziza kwiindlela ezininzi zokuba sesichengeni. Amathamo otshiso ngemitha alinganisiweyo amiselweyo kwi-SSR aya kuhlolwa ngokweemfuneko zolawulo ze-NNR. Uhlolo lweziza ezomnyuliweyo akufuneki lubonise kuphela ukuthobela imida yethamo le-NNR kunye nemiqobo yethamo, kodwa kufuneka kwakhona luthathele ingqalelo imithetho-siseko ye-ALARA. Ukuba ngaba ithamo elibaliweyo likwiimfuneko ezamkelekileyo ze-NNR, kunokugqitywa ekubeni umngcipheko womhlaza uya kuba kuluhlu lwengzo encinane kubomi, oko okumele inqanaba lwengozi kwimpilo elithatwha ngokuba alibalulekanga okanye linexabiso elincinane. Ukhuselo ngokubhekisele ekuveleni komhlaza ovela kutshiso ngemitha luthathwa ngokuba lwanele kukhuselo olubhekisele kwiziphumo zofuzo kunye nazo naziphi na ezinye izifo ezinxulumene notshiso ngemitha.

Uhlolo lweempembelelo luqaqambise ukuba kukho uncitshiso olubanzi olwakhelwe kuyilo lwesixhobo esivelisa umbane oko kusenzelwa ukhuseleko kunye nokuba kukho

amanyathelo amaninzi okhuselo ngokubhekisele kwiziphumo zentsilelo kwiimathiriyeli kunye nezixhobo kunye nempazamo yomntu.

Ngeenjongo ze-EIA, kuyaqondwa ukuba i-NNR iza kukhupha imvume yokwakhiwa kwesikhululo samandla senyukliya kuso nasiphi na isiza esithile kuphela ukuba kuboniswe ukuthotyelwa okupheleleyo kwemida yethamo lotshiso ngemitha kunye nemiqobo yethamo, kuthathelwa ingqalelo imithetho-siseko ye-ALARA kunye neminye imiba enxulumene nemeko yokhuseleko xa iyonke. Kuthathelwa ingqalelo iindlela zohlolo lwethamo ezithiwe thaca kule ngxelo, kwenziwa isincomo sokuba indlela le yamkelwe njengekhusela ngokwaneleyo kwiziphumo zempilo ezingalunganga kumalungu oluntu.

1.24 UHlolo lwezoThutho (Appendix E25)

I-Arcus GIBB (Pty) Ltd (Arcus GIBB) iqeshwe yi-Eskom Holdings SoC (Eskom) ukuba iqalise uHlolo lweeMpembelelo zokusiNgqongileyo (Environmental Impact Assessmen) (EIA) kunye neSicwangciso soAlwulo lokusiNgqongileyo (Environmental Management Plan) (EMP) ekwakhiweni okucetywayo kwesikhululo asamandla senyukliya kunye nezakhiwo ezinxulumene naso kwesinye seziza ezithathu ezonyuliweyo ezizinze kumaPhondo eMpuma kunye neNtshona Koloni, ezizezi:

- I-Duynefontein (ISiza seSikhululo saMandla seNyukliya eSele siKhona sase-Koeberg) – eNtshona Koloni;
- E-Bantamsklip – eNtshona Koloni; kwaye
- E-Thyspunt – eMpuma Koloni.

Ezinye iziza ezibini eMntla-Koloni, eziyi-Brazil ne-Schulpfontein, aziqukwanga kuphononongo olongezelelweyo lwesiGaba sokuKhangela ngokuPheleleyo senkqubo ye-EIA. Iziza ezithathu zamkelwa liSebe leMicimbi yokusiNgqongileyo (Department of Environmental Affairs) (DEA) kwiSigaba sokuKhangela ngokuPheleleyo.

Le Ngxelo yoHlolo lweeMpembelelo zeTrafiki ichaza isiGaba soHlolo soPhononongo seNyukliya-1 lweNgcali yezoThutho.

Isiza sase-**Duynefontein** asifuni iinkqubo zokuphucula ezibalulekileyo ngexesha lezigaba zokwakha nokusebenza kweNyukliya-1 ngokuphathelene nokuphuculwa kwendlela ezinqumlanayo neendlela zokuthutha imithwalo enzima kunye nokuphucula ukukhupha abasebenzi ngexa lengxakeko. Nangona kunjalo, i-Duynefontein ifuna inani elibonakalayo lezithuthi ezingamalalela zokuqinisekisa ukukhupha ngokhuselekileyo abasebenzi abakhayo ukuba kunokwenzeka ingozi kwisiKhululo saMandla seNyukliya sase-Koeberg esikufuphi ngexesha lokwakha. Ezi zithuthi zingasetyenziswa ukuthutha abasebenzi abakhayo ukuya nokubuya kwisiza ngamaxesha engxinano ephezulu KUSASA naseMALANGA.

Isiza sase-**Bantamsklip** sineempembelelo ezibalulekileyo kuthungelwano lwezothutho, nemfuneko yokuphucula inkqubo yezothutho yoluntu, nokuphucula iindlela zemithwalo enzima neendlela nokuphuculwa kweendlela ngeenjongo zokukhupha abasebenzi ngexa lengxakeko kunye nokusebezisa indlela edlula e-Gansbaai. Ngenxa yokuba isiza sase-Bantamsklip simi sodwa, ukuthuthwa kwemithwalo enzima ngendlela kuya kufuna ukuphakanyiswa okubalulekileyo kweendlela yaye nenye indlela yothutho ngolwandle

kuya kufuneka kuthathelwe ingqalelo. Kufuneka kuchongwe isiza esifanelekileyo kwibhitshi ekufuphi ne-Bantamsklip yaye kufuneka kwakhiwe nendawo yokumisa enezibonelelo zokulayisha/ukwehlisa imithwalo.

Isiza sase-**Thyspunt** sifuna ukuphuculwa okungamandla kothutho ngobhekisele kuthutho loluntu, ukungena kunye nokukhutshwa ngexa lengxakeko, ngexa lezigaba zokwakha. Iindlela ekwenziwa izincomo zazo kwiNguqulelo yes-9 yale Ngxelo zaye zaqwalaselwa kwakhona ngenxa yezimvo zoluntu kunye nezincomo ezifunyenwe phakathi kowama-29 Meyi 2011 kunye nowe-2 Juni 2011. Ngokusekelwe kwizimvo ezifunyenweyo, u-R330 ngoku kucetywa ukuba asetyenziselwe izithuthi zetrafiki encinane kunye nezithuthi zemithwalo emikhulu kakhulu, kwaye amacandelo kuza kufuneka ukuba aphuculelwe le njongo. Indlela yase-Oyster Bay kucetywa ukuba iphuculwe ibe yindlela egangathiweyo phezulu yaye isetyenziswe ngexesha lesigaba sokwakha nokusebenza ukulungiselela ukuba kungene abasebenzi, izithuthi zetrafiki ezilula, izithuthi zemithwalo emikhulu kwaye ibe yindlela yokukhupha abasebenzi ngexa lengxakeko kwimimandla efana ne-Oyster Bay. I-DR1762, edibanisa u-R330 kunye ne-Oyster Bay Road ngoku kucetywa ukuba igangathwe phezulu ukuze ibonelele ngokudibana okuphuculiweyo kwimpuma-ntshona. Iindlela ezizezinye ekunokuhanjwa kuzo kwimpuma kunye nentshona ye-Humansdorp nazo ngoku kucetwya ukuba zakhiwe ukwehlisa impembelelo zetrafiki kumbindi we-Humansdorp.

1.25 Isishwankathelo soPhumezo sokuSabela kwiNgxakeko (Appendix E26)

Le Ngxelo yeMpembelelo yokusiNgqongileyo (EIR) iquka izigqibo namanyathelo okunciphisa awayamaniswa nokwakha nokusebenza kweSikhululo saMandla seNyukliya esiqhelekilyeo (NPS) yaye esiyamaniswa nesibonelelo sokusebenza kwiziza ezithathu eMpuma Koloni (1) naseNtshona Koloni (2). Ekuqaleni iziza bezichongwe ngenxa yophando lwesiza olwenziwa ukususka kwiminyaka yee-1980 nakuPhononongo lokuKhangela ngokuPheleleyo lweEIA. Olu phononongo lobungcali luquka ukuSabela kwiNgxakeko yaye lwaqhutywa nguMogwera Khoathane/SRK Consulting.

Injongo yolu vavanyo kukubonisa ukuba nakho kwesicwangciso sengxakeko (esinxulumene nenyukliya) phakathi kommandla wophononongo. IiMvavanyo zesiCwangciso seNgxakeko zibonelela abenzi bezigqibo ngolwazi oluya kukhokela isigqibo sabo ngokhetho lokugqibela lwesiza.

Ukulungela ingxakeko kumxholo weNPS kungachazwa njengamanyathelo awenza umntu ozimeleyo nemibutho bakwazi ukwenza ukusabela okukhawulezileyo nokunesiqhamo kwingxakeko kumxholo weengxakeko zenyukliya. Izenzo ezikhuselayo ziquka amanyathelo okuthintela ukuba sesichengeni koluntu kungcoliseko lweradioactive ngokuba sesichengeni ngokuphandle, ukuphefumla nokuginya. Iinjongo zezi zenzo kukuthintela iziphumo eziqinisekisayo (ukufa kwangoko) nokunciphisa iziphumo zokumisela ngokungahlelwanga (ikakhulu kumhlaza).

Ngokuphathelele kwiingxakeko zenyukliya, iiseti ezimbini zeemfuneko kufuneka ziphunyezwe.

Iimfuneko zokusebenza (ukusabela); kunye
Neemfuneko zesibonelelo sokusebenza (ukulungela)

Iimfuneko zokusabela okusebenzayo zibhekisa “kwisakhono” sokwenza umsebenzi. “Isakhono” siquka ukuba nazo izibonelelo zokusebenza ezifana negunya nemfanelo, umbutho, amagosa, iinkqubo, amalungiselelo, izixhobo zokusebenza noqeqesho lokwenza umsebenzi ngempumelelo okanye umsebenzi xa kufuneka ngexesha lengxakeko.

“Isakhono” siquka ukuba nalo igunya neemfanelo ezifunekayo, umbutho, amagosa, iinkqubo, amalungiselelo, izixhobo zokusebenza noqeqesho lokwenza umsebenzi ngempumelelo okanye umsebenzi xa kufuneka ngexesha lengxakeko. Kulo mxholo, isibonelelo sokusebenza sixela ezothutho nothungelwano loqhagamshelwano, imisebenzi yezeshishini kunye, ngokubanzi, nantoni enokuba nefuthe lokukhawulezisa intshukumo ekhululekileyo yabantu nezithuthi kwinqila yesiza.

Ekuboniseni ukuba nakho ukwenzeka kwesicwangciso sengxakeko, imiba emininzi enxulumene nesiza kufuneka ithathelwe ingqalelo. Eyona miba ibalulekileyo yile:

Ukuxinana nokusasazeka kwabemi, imigama ukusuka kwimibindi yabemi, amaqela abemi ekunzima ukuwanika ukhuselo okanye ukuwafudusa kwimeko yengxakeko; Imbonakalo ezikhethekileyo zejografi, ezifana neziqithi, imimandla yeentaba, imilambo, izakhono zezithuthi zengingqi nothungelwano loqhagamshelwano; Imisebenzi yezolimo enovakalelo kwizinto ezinokukhutshwa zeeradionuclide, kunye.

Neziganeko zentlekele zangaphandle okanye iziganeko zendalo ezinokubonwa kwangaphambili.

Iziphumo neenkuthazo ezingundoqo zolu phononongo lokuSabela kwiNgxakeko zinokushwankathelwa ngokulandelayo:

Iingcamango ngeziBonelelo zokuSebenza

ISiza saseDuynefontein siquka isiKhululo esikhoyo saMandla seNyukliya saseKoeberg, ngako oko isibonelelo sokusebenza sokusabela kwingxakeko neenkqubo zikhona. Nangona kunjalo, iziphumo zoHlalutyo loKhuseleko, olwenziwe phambi kokugunyaziswa njengenxalenye yeNgxelo yoHlalutyo loKhuseleko ziya kuqinisekisa ukuba izibonelelo zokusebenza zangoku zinokwanela ukujongana neemfuno zesiKhululo saMandla seNyukliya-1 esongezelelweyo esicetywayo.

Iziza zaseBantamsklip naseThyspunt ziya kufuna ukuphuculwa kwezibonelelo zokusebenza njengoko zikwimimandla esemaphandleni njengoko kubonisiwe ngamaphononongo okusetyenziswa komhlaba awenziwe nguEskom.

Usasazeko lwaBemi

Inkqubo yokumisela yeNPS ngokubanzi iquka uphononongo nophando lommandla omkhulu wokukhetha isiza sokuhlolwa esinye okanye ezingaphezulu (jonga IsiKhokelo soKhuseleko seIAEA 50-SG-S9 kuPhando lweSiza) lulandelwe luxabiso olunzulu lwezo ziza.

Imiba engundoqo ethathelwa ingqalelo yile:

- Isiphumo senqila yesiza kumatshini;

- Isiphumo somatshini kwinqila;
- Abemi.

Ngethuba lesigaba "sokhetho", apho ngelo xesha kusenziwa uhlalutyo lwenqila, iziza kwimimandla eneyona ngxinano iphezulu yabemi iya kushenxiswa kwiziza ezifunwayo; ngokwesiphumo kwamkelekile, xa zonke izinto zithathelwa ingqalelo, ukukhetha imimandla enabemi abambalwa kunaloo mimandla enobudolophu obuphezulu. Iziza zaseThyspunt naseBantamsklip ziyanelisa ngokuphathelele koku.

Iziza zaseThyspunt naseBantamsklip zamkelekile ngokubhekisele kwiingcamango zesicwangciso sengxakeko njengoko indlela entsha eyamkelweyo yeEUR eyamkelwe nguEskom yesicwangciso sengxakeko ikhuthaza ukuba iNPS ingakhiwa eMzantsi Afrika ngaphandle kwemfuneko yamancedo engxakeko angaphandle kwesiza awexesha elifutshane afana nekhusi, ukufudusa okanye i-iodine prophylaxis (oko kukuthi akukho manyathelo okuthintela angxamisekileyo). Iimfuneko zeEUR zimisela ukuba izitishi zamandla zenyukliya zakule mihla kufuneka zingabinazo okanye zibe nezona zimbalwa iimfuneko zamancedo engxakeko (umz. ukufudusa) ngaphaya kwama-800m ukusuka kwireactor, yaye zibonelela ngeseti yemigqaliselo ekufuneka ireactor iyanelise ukuze ibonise ukuba ingakhiwa ngaphandle kweemfuneko zesicwangciso sengxakeko.

1.26 Isishwankathelo SoPhumezo SoLawulo LweSiza (Appendix E27)

Le ngxelo iphanda iimpembelelo namanyathelo okunciphisa afunekayo awayamaniswa nolwakhiwo nokusebenza kweSikhululo SaMandla SeNukliya Esiqhelekileyo (NPS) kwakunye nezibonelelo zokusebenza ezayamaniswa kwisiza esinye eMpuma Koloni neziza ezibini eNtshona Koloni. Iziza zichongiwe ngokusekelwe kuphando olwenziweyo kwisiza ukusuka kwiminyaka yee-1980. Le EIR iquka uLawulo Lwesiza yaye beluqhutywa nguSRK Consulting.

IEskom iceba ukwakha iNPS yohlobo lobuchwepheshe lweSixhobo Sokwenza Amandla Samanzi Axinzelelweyo (Pressurised Water Reactor), ngomthamo wama- ~ 4 000 MWe. INPS ecetywayo iya kuquka isixhobo senyukliya sokwenza amandla ngeeathom, indawo yeinjini yomsinga, isibasi esisetyenzisiweyo, amalungiselelo okugcina isibasi senyukliya, amalungiselelo okujongana nenkunkuma, ukungenisa nokukhupha izakhiwo kwakunye nezibonelelo zokusebenza zeentlobontlobo zeenkonzo ezincedisayo. Umatshini uya kuba nobomi bezoshishino beminyaka engama ~60.

Zontathu iziza ezicetywayo, eThyspunt (eMpuma Koloni), eBantamsklip naseDuynefontein (eNtshona Koloni), ziselunxwemeni. Ezibini zokuqala ziziza ezingazange zakhiwe uphuhliso ngaphambili xeshikweni iSikhululo Samandla Senyukliya saseKoeberg esikhoyo sikwisiza sokugqibela.

Inkcazelo Yomgama Wophando (Terms of Reference) (ToR) yophononongo lwengcali yoLawulo lweSiza kukuvavanya iintlobo ngeentlobo zemiba ngokuphathelele ulawulo lwesiza, kuquka okulandelayo:

- Ukhuseleko lweSiza;
- Ulawulo lokufikelela (ukungena nokuphuma, kuwo omabini amabakala okwakha nokusebenza); kunye
- Nemimandla elawulwa ngabanini-ndawo.

Indlela elandelwayo yeEIR yoLawulo lweSiza iquke uphononongo ngekhompyutha nokuhlola isiza ngokusekwe:

- Kumacandelo achanileyo eeNkcukacha zoBuchwepheshe zikaEskom Zophando Lweziza Zenyukliya (Eskom 2006, 2009);
- Umthetho ochanileyo/osemxholweni;
- Izahluko ezichanileyo Zengxelo Yokhuseleko Lwesiza saseKoeberg (Eskom 2006, 2009);
- Amanyathelo olawulo lwesiza eKNPS (Eskom 2006);
- Uphando Lwesiza; kunye
- Nomatshini Wamandla Wokubonisa iSixhobo sokwenza aMandla soMaleko oSetyenziswa njalo Wohlalutye (kwisiza saseDuynefontein). Uphononongo lweNgcali loVavanyo lweMpembelelo yokusiNgqongileyo: uKhuseleko lweSiza (Malepa Holdings 2007).

Ngokusekelwe kulwazi olungentla novavanyo lwempembelelo, kungafikelelwa kwizigqibo ezilandelayo:

IDuynefontein:

- Isiza sele siphuhlisiwe njengeNPS enofikelelo olupheleleyo nolawulo lwesiza, ebesisebenza ukususka kugunyaziso ngowe-1979 naphambi kolu lwakhiwo;
- Inamalungiselelo apheleleyo abatyeleli kunye neZiko laBatyeleli;
- Ulondolozo lweNdawo lwaseKoeberg luphuhliswe kwisiza;
- Kukho iindlela ezityhutyhayo zokuhamba ngeenyawo nokukhwela iibhayisekile zentaba;
- Ufikelelo luya kungena ngofikelelo olutsha ngeendawo zolawulo kunye neendlela ezikhoyo eziphuculweyo ezikhokelela kwindlela engu-R27;
- Ziya kuba mbalwa iimpembelelo ezongezwayo okanye ezongezelelekayo ngophuhliso lweNyukliya-1; yaye
- Ukuxabisa impembelelo *bubunzulu obuphantsi*, *isiphumo* kunye *nokubaluleka*, ikakhulu *kumphakamo ophezulu wentembeko* yaye ayinakubakho impembelelo yemithombo engenavuselelwa. Azikho iziphene ezibulalayo.

IThyspunt:

- Sisiza esinako ukuphuhliswa;
- Izinto eziphilayo neendawo zazo zokuphila zemigxobhozo ezinovakalelo kunye neembonakalo zamafa esizwe ezikhoyo ziya kulondolozwa ngokuphumeza amanyathelo olawulo lwesiza;
- Ukufikelela kwisiza ngoku kunyiniwe yaye kulawulwa ngokubiyelwa nangamasango eelektroniki/ atshixwayo;
- Indawo entsha yofikelelo yolawulo iya kuphuhliswa kumda wolawulo ngumnini-ndawo entshona okanye empuma nakucingo lokhuseleko olungaphandle nolungaphakathi; yaye
- Ukuxabisa impembelelo *bubunzulu obuphantsi, isiphumo* kunye *nokubaluleka*, ikakhulu *kumphakamo ophezulu wentembeko* yaye ayinakubakho impembelelo yemithombo engenavuselelwa. Azikho iziphene ezibulalayo.

IBantamsklip:

- Sisiza esinako ukuphuhliswa;
- Ukufikelela kwisiza ngoku kunyiniwe yaye kulawulwa ngokubiyelwa nangamasango;
- Nangona kunjalo, indlela yetha u-R43 igqitha phakathi kwesiza;
- Ufikelelo luya kungena ngendawo/ iindlela zolawulo ukusuka kwindlela u-R43 yaye iindawo zolawulo lokufikelela zikucingo lokhuseleko olungaphandle nolungaphakathi; yaye
- Ukuxabisa impembelelo *bubunzulu obuphantsi, isiphumo* kunye *nokubaluleka*, ikakhulu *kumphakamo ophezulu wentembeko* yaye ayinakubakhona impembelelo yemithombo engeke ivuselelwe. Azikho iziphene ezibulalayo.

Ukhetho lokuNgahambi:

- UEskom uya kuthengisa iziza zaseThyspunt naseBantamsklip;
- Ukuxabisa impembelelo *bubunzulu obuphantsi* kunye *nesiphumo esiphakathi* kunye *nokubaluleka okuphantsi* malunga neDuynefontein kunye *nobunzulu obuphantsi*, *isiphumo esibi* kunye *nokubaluleka okuphezulu* malunga neziza zeThyspunt neBantamsklip.

Ukutshintsha kwemozulu nomatshini wokususa ityuwa azinakuba naliphi ifuthe kuvavanyo lwempembelelo kuLawulo lwesi Siza.

Amanyathelo okuNciphisa

Amanyathelo alandelayo okunciphisa ayandululwa:

- Yenza uqhagamshelwano olucacileyo lomgaqo-nkqubo wofikelelo kwiipropati kuluntu, usebenzisa iibhodi zezaziso kumasango ofikelelo nangokuqhagamshelana ngqo nabahlali abakufuphi;
- Cinga ngokubonelela ngeemvume zokuvumela ufikelelo lwemisebenzi yokuloba iintlanzi nokubukela iminenga nakuwuphi ummandla waselunxwemeni wokubekela bucala;
- Gcina ufikelelo loluntu kwindlela u-R43 apho icanda isiza saseBantamsklip;
- Phumeza amanyathelo okunciphisa akhuthazwayo kwingxelo yovavanyo lwempembelelo yembonakalo;
- Seka ulondolozo lwendalo phakathi kommandla olawulwa ngabanini-ndawo yaye ubonelele ngofikelelo ngeenjongo zophando lwezenzululwazi;
- Londoloza yaye utyale ngokutsha izityalo zeli lizwe;
- Gcina yaye ulondoloze iimbonakalo zokusingqongileyo kwiziza ezifana nemigxobhozo;
- Londoloza iimbonakalo zamafa obuzwe;
- Lungiselela uphengululo lwemiba yolawulo lwesiza eziphakanyiswa kule EIR ngaManqaku eSizwe anguNdoqo ngokusebenza ngoMphathiswa waMapolisa;
- Qinisekisa ukufumaneka kwenkxaso nayiphi efunekayo yolawulo lwesiza evela kwiiarhente ezichanileyo zolawulo ezifana nezamapolisa, ezomkhosi, ezamajoni aselwandle nezaselunxwemeni;
- Dibanisa amanyathelo olawulo akhethekileyo esiza namanyathelo okhuseleko akhoyo engingqi nawenqila;

- Phuhlisa isiCwangciso soLawulo lokusiNgqongileyo phambi kokwakha. Chaza amanyathelo okunciphisa, ukubeka iso izinto ezinokubalwa, itekeni 'iinjongo' kunye neemfanelo kwiEMP; yaye
- Qesha iGosa loLawulo lokusiNgqongileyo.

IsiCwangciso soLawulo lokusiNgqongileyo kufuneka siyilwe phambi kokwakha ngokucebisana noEskom. Iimfanelo, amanyathelo okunciphisa nokubeka iso ukusebenza kwazo ngempumelelo kufuneka kuchazwe ngokucacileyo.

1.27 Isishwankathelo soPhumezo sokuCwangcisa iGrid (Appendix E28)

UEskom ucinga ukwakha iqela elitsha lezikhululo zamandla zenukliya ukwanelisa imfuno yeziswe yombane nokuphambukisa umthombo womthwalo wesiseko wemveliso ukusuka kwimveliso ebaselwa ikakhulu ngamalahle. Isigaba sokuqala sale nkqubo yenukliya sibizwa iNukliya 1 eya kuqulatha nokuba ziiyunithi ezintathu ze-1100MW okanye iiyunithi ezimbini ze- 1600MW, ezinika itotali ephakathi kwama-3200MW ukuya kuma-3300MW. UEskom sele echonge iziza ezinokubakhona ezintlanu elunxwemeni lwaseKapa yaye uphononongo loVavanyo lweMpembelelo yokusiNgqongileyo (EIA) lwenziwe ukumisela impembelelo enokubakhona kwisikhululo samandla senukliya sama-3300MW kwiziza ezintlanu.

Ukunika imbono jikelele yemitshintshelo yamandla eya kwenzeka njengoko ukuveliswa kwenukliya kudityaniswa kuthungelwano lothumelo lwaseKapa kunokwenziwa lula ngeenani leepaseji zothumelo olungundoqo lwamandla. Oku kubonakalisiwe kwisazobe soku-1 esibonisa iipaseji zamandla ezingundoqo zaseKapa (ezileyibhiliwe ngoA, B, C1, C2 noC3) yaye neziza zenukliya ezicetywayo (ezileyibhilwe ngoB, D, T, S noZ). Iipaseji zeC1, C2 neC3 zibonisa iipaseji zothumelo ezikhoyo xeshikweni uA noB zibonisa iipaseji zothumelo ezintsha ekuya kufuneka zisekwe.

Iimfuneko zomdibaniso wothumelo kwiziza ezintlanu zezilandelayo:

EThyspunt

Esi sisiza esizimele sodwa yaye sibonelela ngomthwalo wesiseko wokungenisa imveliso kwiGrid eseMazantsi (eMpuma Koloni) equka ngokungamandla imithwalo yeCoega, yeBhayi neyeMonti. Umdibaniso uya kudityaniswa kwiipaseji zamandla ezikhoyo zeKapa zeC3 neC1.

Isigaba sokuqala seNukliya 1 eThyspunt siya kufuna umdibaniso wothumelo olandelayo ukwanelisa imigqaliselo yokucwangcisa:

- Iintambo ezi-2x eThyspunt-Dedisa 400kV
- Intambo e-1x eThyspunt-Grassridge 400kV
- Isikhululo esinganeno esitsha eBhayi (PE S/S) 400/132kV
- Iintambo ezi-2x eThyspunt - kwiPE S/S eNtsha 400kV
- Intambo e-1x kwiPE S/S eNtsha - Dedisa 400kV
- Intambo e-1x kwiPE S/S eNtsha - Grassridge 400kV

Iziza uB noK – eBantamsklip naseDuynefontein (eKoeberg)

Ezi ziza ezibini ziya kungenisa kummandla weGreater Cape Peninsula weGrid yaseNtshona (eNtshona Koloni) eya kuquka imithwalo evela eSaldahna, eKapa nokuya ngqo ezantsi eMossel Bay. Ngokwembono yokulingana koThumelo lweMfuno yeMW zinokuthathwa zikummandla ofanayo. Umdibaniso wezi ziza ezibini uya kudityaniswa kwiipaseji zamandla zaseKapa ezikhoyo zeC2 neC1.

Isiza saseBantamsklip sikude ngokwenene kulo naliphi iziko elingamandla lomthwalo yaye uthungelwano olunamandla lwama-765kV lonxibelelwano nothungelwano lukaEskom kuya kufuneka lwakhiwe. Phantse onke amandla aya kuthuthelwa kuthungelwano lwama-765kV ngokujikela kwisikhululo esinganeno esitsha saseKappa sama-765/400kV esikufuphi neWolseley ukwenzela usasazo olongezelelweyo.

Isigaba sokuqala seNukliya 1 eBantamsklip siya kufuna izinto ezilandelayo:

- Iintambo ezi-3x 765kV eBantamsklip-Kappa 765kV
- Iintambo ezi-2x eBantamsklip – Bacchus 400kV (endaweni yentambo enye eya eProteus ngokwengxelo yokuqala)

Isiza esicetywayo saseDuynefontein sikumantla nje esikhululo samandla esikhoyo saseKoeberg. Isikhululo esinganeno esitsha saseOmega 765/400kV MTS siya kusekwa kufuphi neKoeberg njengenxalenye yeeprojekthi zoKomeleza iKapa. Amanye amandla eNukliya 1 aya kudityaniswa ngqo kuthungelwano lweCape Peninsula 400kV ukuthumela kumthwalo okhulayo yaye amandla ayintsalela aya kuthuthelwa kuthungelwano olungundoqo kwaEskom ngokujikela eOmega ukwenzela usasazo olongezelelweyo okanye ukuthunyelwa emantla.

Isigaba sokuqala seNukliya 1 eDuynefontein siya kufuna izinto ezilandelayo:

- Iintambo ezi-3x eDuynefontein - Omega 400kV
- Iintambo ezi-2x eDuynefontein - Stikland 400kV
- Intambo yokurhintyela iAcacia-Muldersvlie 400kV ukuya eOmega naseDuynefontein

Inkqubo yeEIA ibonisa ukuba intambo ecetywe ekuqaleni yeDuynefontein-Philippi 400kV ibingenakho ukubakhona yaye ngenxa yoko isicwangciso somdibaniso sitshintshelwe kwintambo yokuya eStikland yaye endaweni yoko nentambo yerhintyela ekhoyo eAcacia- Muldersvlei.

Iziza uS noZ – eSchulpfontein naseBrazil

Iziza zaseSchulpfontien naseBrazil zikummandla waseKleinsee yaye zigqagqelene ngama- 40km kuphela, ngako oko zinokuthathwa ngokombane zikwindawo efanayo. Mncinci kakhulu umthwalo wengingqi yaye zikude kakhulu kuthungelwalo lothumelo olungundoqo lakwaEskom. Esona sikhululo singaneno sikufutshane sothumelo olukhulu sisikhululo esinganeno saseAggeneis 400kV, phakathi kweSpringbok nePoffadder, eyinxalenye ebuthathaka yonxibelelwano.

Ukuze kudityaniswe iNukliya 1 kwezi ziza kuya kufuneka kusekwe iipaseji ezimbini ezintsha zothumelo lwamandla. Imigca eyenziwe amaqhagamshela (- - -) ephawulwe njengoA noB imele iiPaseji zaMandla ezintsha ekuya kufuneka zisekwe. Le iya kuba yipaseji “esuka kuNxweme lwaseNtshona ukuya eGauteng” (iPaseji A) kunye nePaseji

“esuka kuNxweme lwaseNtshona ukuya kwiPeninsula” (iPaseji B). Okungenani iintambo ezimbini zama-400kV ziya kufuneka kwiPaseji uB yaye iPaseji uA iya kuqulatha nokuba ziintambo ezingu-UHV 765kV okanye iintambo ezingu-HVDC 600kV. Le ndleko ephathekayo nempembelelo yexesha zithathelwe ingqalelo xa kuthelekiswa iindleko zokhetho lomphakamo ophezulu wothumelo ngokuchasene nezinye iziza ezintathu. Ngenxa yeso sizathu ezi ziza ezimbini azithathwa zinokulungela ukusekwa kweNukliya 1 yaye zishiyiwe.

1.28 Senkunkuma Yenyukliya (Appendix E29)

Inkqubo yoVavanyo lweMpembelelo yokusiNgqongileyo (iEIA) yesiKhululo saMandla seNyukliya yeNyukliya-1 esicetywayo ingahlukaniswa ngokwesiGaba sokuKhangela ngokuPheleleyo kunye nesiGaba soVavanyo lweMpembelelo. Ngexesha lesiGaba soKhangela ngokuPheleleyo, imiba eliqela ichongelwe ukuqwalaselwa kwisiGaba soVavanyo lweMpembelelo.

Injongo yolu phononongo kukujongana nemiba echongiweyo ngexesha lesiGaba sokuKhangela ngokuPheleleyo enxulumene nolawulo lwenkunkuma yokusasazeka ngemitha (radioactive) eya kuveliswa ngexesha lokusebenza nelokuphelisa ugunyaziso lwesiKhululo saMandla seNyukliya yeNyukliya-1. AmaGunya okuSebenza ophononongo afuna inkcazo yezinto ezilandelayo:

- Imithombo, ubuninzi nezinga lokusasazeka ngemitha layo yonke inkunkuma yokusasazeka ngemitha (elulwelo, eyigesi, neqinikeyo) eqikelelwa ukuba iyakuveliswa sisiKhululo esicetywayo saMandla seNyukliya yeNyukliya-1.
- Indlela inkunkuma yonke yokusasazeka ngemitha yesiKhululo saMandla seNyukliya yeNyukliya-1 iya kulawulwa ngayo ngokusekwe kumgaqo-siseko wokusuka esizalweni ukuya engcwabeni.
- Indlela inkunkuma yokusasazeka ngemitha iya kulungiswa ngayo nokubanakho ukulungisa inkunkuma yokusasazekwa ngemitha eveliswa sisiKhululo saMandla seNyukliya yeNyukliya-1.
- Uqikelelo lwesixa sezinga eliphantsi neliphakathi lenkunkuma yokusasazeka ngemitha esinokuveliswa sisiKhululo saMandla seNyukliya yeNyukliya-1 nomthombo wale nkunkuma (iimpahla, njl.).
- Indlela leyo inkunkuma yokusasazeka kwemitha yezinga eliphantsi neliphakathi ithuthwa ngayo ngoku ukuya eVaalputs ukusuka kwisiza sesiKhululo saMandla seNyukliya saseKoeberg.
- Indlela leyo inkunkuma esasazeka ngemitha yezinga eliphantsi neliphakathi (iLILW) evela kwisiKhululo saMandla seNyukliya yeNyukliya-1 ekumiselwe ukuba iza kuthuthwa ngayo ukuya eVaalputs.
- Amandla afumanekayo okulahla inkunkuma yeLILW eVaalputs.
- Indlela elahlwa ngayo inkunkuma yeLILW eVaalputs.
- Iinkqubo nemigaqo-nkqubo yezizwe yokulahla inkunkuma yezinga eliphezulu lokusasazeka ngemitha (iHLW);
- Umgaqo-nkqubo nobuchule baseMzantsi Afrika malunga nenkunkuma yeHLW nendlela le nkqubo ithelekiseka ngayo nemigaqo-nkqubo yezizwe.
- Indlela inkunkuma yeHLW elawuleka ngayo kwisiza sesiKhululo saMandla seNyukliya esikhoyo eKoeberg, kwakunye
- Nendlela ecetywayo eya kulawulwa ngayo inkunkuma yeHLW evela kwisiza sesiKhululo saMandla seNyukliya yeNyukliya-1.

Ukufikelela iinjongo zophononongo nokuphumeza amaGunya okuSebenza, ingxelo yakhiwe ngendlela elandelayo:

- Section 2 linikela ngenkcazelo jikelele yesakhelo solawulo lwenyukliya esilawula ukuphathwa kwenkunkuma yokusasazeka ngemitha eMzantsi Afrika, njengoko kuchaziwe kwiNational Policy and Strategy for Radioactive Waste Management, kwakunye nenkcazelo jikelele yemithetho esebenzayo malunga nemigangatho yokhuseleko neenkqubo zolawulo.
- Icandelo Section 3 linikela ngamalungu eNkqubo yoLawulo lokuSasazeka ngemitha (Radioactive Waste Management Programme), njengesakhelo solawulo lwenkunkuma esasazeka ngemitha kwisikhululo samandla senyukliya. Ingxoxo yeyesiqhelo yaye isekwe ikakhulu kwizikhokelo ze IAEA ezinikelwe kwiIAEA (2002b).
- Icandelo Section 4 linikela ngenkcazelo jikelele yeempawu zenkunkuma yokusasazeka ngemitha ekulindelwe ukuba iveliswe sisikhululo samandla senyukliya soveliso lwesithathu lokwenene lwamanzi axinzelelweyo. Ingxoxo yahlulwe ngokwenkunkuma yegesi, yokusasazeka ngemitha, yenkunkuma elulwelo yokusasazeka ngemitha, inkunkuma eqinileyo yokusasazeka ngemitha. Ingxoxo iquka umthombo (intsusa) wenkunkuma yokusasazeka ngemitha, ubungakanani (umthamo) benkunkuma nezinga lokusasazeka ngemitha eliyamene nohlobo lwenkunkuma, kangangoko kunokwenzeka.
- Icandelo Section 5 libonelela ngenkcazelo jikelele yeenkqubo zolawulo lwenkunkuma esasazeka ngemitha ethathwa iyinxalenye yeNkqubo yoLawulo lweNkunkuma yokuSasazeka ngeMitha yesiKhululo saMandla seNyukliya yeNyukliya-1, ukusuka ekuvelisweni ukuya ekulahlweni. Ingxoxo iquka ulawulo lwenkunkuma yegesi nenkunkuma yolwelo kwisiKhululo saMandla seNyukliya yeNyukliya-1, kwakunye nenkcazelo jikelele yeenkqubo zolawulo (umz. ukugcina nokulahla) ezicingelwa iLILW neHLW. Apho kufanelekileyo, ingxoxo iquka ukulungisa (unyango olwandulelayo, unyango okanye ukulungiselela) inkunkuma yokusasazeka ngemitha.
- Icandelo Section 1 libonelela ngesiseko sezizwe solawulo lwenkunkuma yeHLW. Le nkcazelo jikelele isebenza njengesiseko sokuthelekisa umGaqo-nkqubo noBuchule boLawulo lweNkunkuma yokuSasazeka ngemitha eMzantsi Afrika, neenkqubo nemigaqonkqubo yezizwe. Ingxoxo iquka inkcazelo jikelele yemigaqo esebenzayo equlethwe kwiJoint Convention on the Safety of Spent Fuel Management kunye neSafety of Radioactive Waste Management (IAEA, 2006a), kwakunye neengqiqo zesiseko zolawulo lweHLW ukuphuma kuncwadi lwezizwe.
- Icandelo Section 7 libonelela ngenkcazelo jikelele yendlela leyo isibaso senyukliya sithuthwa ngayo ngoku ukuya kwisiKhululo saMandla seNyukliya saseKoeberg, nendlela leyo isibaso senyukliya kunokwenzeka sithuthwe ngayo ukuya kwisiKhululo saMandla seNyukliya yeNyukliya-1 esicetywayo.
- Icandelo Section 8 linikela ngokuchongeka nexabiso lazo zonke iimpembelelo zokusingqongileyo ezibalulekileyo ezinokuvela ngenxa yenkunkuma yokusasazeka ngemitha nesibaso esisebenzileyo kwisiKhululo saMandla seNyukliya yeNyukliya-1 esicetywayo.
- Icandelo Section 9 lishwankathela izigqibo ezingamandla zengxelo.

Izigqibo ezingamandla ezifunyenwe kuphononongo zezi:

- IsiKhululo saMandla seNyukliya yeNyukliya-1 sivelisa inkunkuma elulwelo, eyigesi nezinto eziqinileyo zokusasazeka ngemitha njengeziveliso ezilisolotya (by-products) zeemeko zokusebenza nemisebenzi yokuphelisa ugunyaziso. Inkunkuma eqinileyo yokusasazeka ngemitha yahlulwe ngokongezelelweyo ukuba yinkunkuma enokubumbana, inkunkuma engenakho ukubumbana, inkunkuma engaqhelekanga nesibaso esisebenzileyo. Enye inkunkuma ngaphandle kwenkunkuma yokusasazeka ngemitha eya kuveliswa ingahlulwa ukuba yinkunkuma eqhelekileyo nenkunkuma eyingozi.
- Iinkqubo zolawulo lwenkunkuma yokusasazeka ngemitha ecingelwayo kwisiKhululo saMandla seNyukliya yeNyukliya-1 zihambelana nezikhokelo zeIAEA malunga neNkqubo yoLawulo lweNkunkuma yokuSasazeka ngeMitha yezikhululo zamandla zenyukliya ukusuka ekuvelisweni ukuya ekulahlweni.
- IsiKhululo saMandla seNyukliya yeNyukliya-1 sizama ukunciphisa ukuvelisa yonke inkunkuma eqinileyo, elulwelo neyigesi yokusasazeka ngemitha ngokomthamo kwakunye nomsebenzi wesiqulatho, njengoko kufunwa kwizimo ezintsha zereactor. Oku kwenziwa ngeenkqubo ezifanelekileyo zokulungisa, ukulungiselelela imeko, ukuphatha nokugcina. Ngaphezu koko, ukuveliswa kwenkunkuma yokusasazeka ngemitha kuncitshiswe ngokusebenzisa iinkqubo ezilungileyo zosasazeko ngemitha, ngokwahlula ngokwemimandla, ukubonelela ngenkqubo esebenzayo yokuhambisa amanzi amdaka nokungenisa nokukhupha umoya, iziphetho ezifanelekileyo nokusebenzisa ezona nkqubo zilungileyo zangoku zokuphatha inkunkuma eqinileyo yokusasazeka ngemitha. Apho kunokwenzeka, isiKhululo saMandla seNyukliya yeNyukliya-1 sisebenzisa izinto kwakhona okanye silungiselele usetyenziso lwezinto kwakhona.
- Injongo yokulungisa inkunkuma yegesi neyolwelo kukunciphisa amazing okusebenza kwisakhiwo sereactor kunye namanzi negesi emdaka yeemeko zokusebenza. Kananjalo iqinisekisa ukuba amathamo okusasazeka ngemitha kumalungu oluntu ngenxa yezinto ezikhutshwayo kokusingqongileyo (oko kukuthi, ulawulo lwezinto ezikhutshwayo) akagqithi iqhezu lomda wethamo loluntu (umda wethamo). Ngenxa yale njongo, ubuNgakanani obuGunyazisiweyo bezinto eziKhutshwayo (Authorised Discharge Quantities) (AADQ) buchaziwe malunga nale miphunga yenkunkuma. Uhlolo lokuthobela luya kuqhutywa emthonjeni nakokusingqongileyo. Ukulungisa inkunkuma eqinileyo kujolise ekunciphiseni umthamo wenkunkuma (umz., ukubumbana), ukuqulatha umsebenzi onokusasazeka (umz. ukungashenxiseki), okanye ukunciphisa umsebenzi wenkunkuma engaqhelekanga (umz. ukuphelisa ungcoliseko). Umsebenzi ocetywayo wokulungisa nokulungiselela imeko yenkunkuma eqinileyo kuhambelana nogcino olukhuselekileyo nokuvumelana nemilinganiso eyamekelekileyo yenkunkuma eVaalputs.
- Iinkqubo ziyilelwe ukugcina inkunkuma eqinileyo elungisiweyo yokusasazeka ngemitha ixesha lokuya kwiminyaka emithathu kwisibonelelo. Iziqulathi zokugcina zihambelana neemfuneko zokulahla inkunkuma eqinileyo kwisibonelelo sokulahla inkunkuma yokusasazeka ngemitha eVaalputs. Inkunkuma engafanelekanga ukulahlwa eVaalputs iya kugcinwa kwisiza kude kube isibonelo esifanelekileyo siyafumaneka.
- Ukudlulisa nothutho oluyameneyo lwenkunkuma ukuya eVaalputs kuya kuhambelana nokuthuthwa kwenkunkuma ukusuka kwisiKhululo saMandla seNyukliya saseKoeberg. Oku kuya kwenzeka ngokwezibonelelo ezifanelekileyo zemiThetho yoKhuseleko loThutho lweMpahla yokuSasazeka ngeMitha yeIAEA, ngokulawulwa yindlela yokuhlela. Injongo yemiThetho kukukhusela abantu, ipropati nokusingqongileyo kwiziphumo zokusasazeka ngemitha ngexesha lokuthutha izinto

ezisasazeka ngemitha. NgokwemiThetho, inkqubo yothutho ixhomekeke kukhuselo lokusasazeka ngemitha, ukusabela kwingxakeko, ukuqinisekisa ubulunga, nokuthobela iinkqubo zokuqinisekisa.

- Ingqiqo yokulahla inkunkuma eqinileyo eVaalputs iqulethe imijelo ekufuphi nomphezulu kusetyenziswa kweziqulathi zentsimbi ukwenzela inkunkuma enezinga eliphantsi neziqulathi zekonkriti ukwenzela inkunkuma yezinga eliphakathi. Ukhuselo lwexesha elide lwesibonelelo, oluthobela ezona nkqqubo zilungileyo zezizwe zokulahla inkunkuma yezinga eliphantsi neliphakathi, lubonisiwe ukwenzela uluhlu lwesizwe lwenkunkuma yokusasazeka ngemitha. Uluhlu olwenzelwe le njongo luquka inkunkuma yesiKhululo saMandla seNyukliya yeNyukliya-1 esicetywayo. Ngako oko iVaalputs inomthamo ongaphaya kokwanelisa wokulahla inkunkuma eqinileyo ekuqikelelwa ukuba iya kuveliswa sisiKhululo saMandla seNyukliya yeNyukliya-1.
- Inkqubo yokuPhatha nokuGcina iziBaso (Fuel Handling and Storage System) ecetywayo yokulawula nokugcina izibaso ezisetyenzisiweyo zesiKhululo saMandla seNyukliya yeNyukliya-1 ziya kuba nomthamo owaneleyo wokugcina nokhuselekolwazo zonke izibaso ezisetyenzisiweyo eziveliswe ngalo lonke ixesha lokusebenza koomatshini nokugcina izibaso ezisebenzileyo neminye iminyaka eli-10 emva kokuphelisa ugunyaziso xa kukho imfuneko. Ngako oko kusemva kweminyaka engama-70 kuphela apho isibonelelo sokugcina kwisiza (okanye kwenye indawo) kuya kufuneka siphuculelwe ukugcina nokulawula izibaso ezisetyenzisiweyo. Oku kuya kubonelela ngexesha elaneleyo lokuchaza nokuphuhlisa ubuchule bolawulo bexesha elide malunga nezibaso ezisebenzileyo zesiKhululo saMandla seNyukliya yeNyukliya-1, umz. isibonelelo sokulahla esikhulu sembonakalo yokwakheka komhlaba okanye enye indlela.
- Xa ukulungisa kwakhona izibaso ezisetyenzisiweyo kungabekelwanga bucala njengokhetho lolawulo lwezibaso ezisebenzileyo, ayikho injongo yokulungisa kwakhona izibaso ezisebenzileyo zesiKhululo saMandla seNyukliya yeNyukliya-1 ngoku. Isizathu esingamandla isesexabiso eliphezulu elayamene nokulungisa kwakhona izibaso ezisetyenzisiweyo.
- Iinkqubo nemigaqo-nkqubo yezizwe ngokuphathelele kwizibaso ezisetyenzisiweyo nolawulo lwenkunkuma yezinga eliphezulu zisekwe kwimigaqo yeJoint Convention on the Safety of Spent Fuel Management kunye neSafety of Radioactive Waste Management. Ngokwezizwe, le nkunkuma ngoku iyagcinwa (ngokwesiqhelo ngaphezu komhlaba), kulindwe uphuhliso lweendawo zokulahla kwimbonakalo yokwakheka komhlaba. Xa amalungiselelo okugcina ebonise ukwanelisa yaye eqhutyiwe ngaphandle kweengxaki, kuvunyelwene ngokubanzi ukuba la malungiselelo ngawethutyana yaye akamelanga isisombululo sokugqibela.
- Imingeni emibini yesiseko yokuphucula inkqubo yokwahlukanisa inkunkuma yokusasazeka ngemitha kukukhetha isithintelo esifanelekileyo sokwakheka komhlaba (into engumamkeli) nokuyila isithintelo esenziwe ngobunjineli obunesiqhamo. Kwiilebhu zophando lwangaphantsi komhlaba kwenziwe igalelo elilunge kakhulu kuphando lokwahlukanisa inkunkuma xeshikweni ulwamkelo loluntu lweeprojekthi zokwahlukanisa inkunkuma yokusasazeka ngemitha kuseyeminye yemingeni emikhulu.
- UmGaqo-nkqubo weSizwe woBuchule woLawulo lweNkunkuma yokuSasazeka ngeMitha (National Radioactive Waste Management Policy and Strategy) uhambelana nenkqubo yezizwe yolawulo lweHLW. Nangona kunjalo, imithetho eyongezelelweyo enzulu nangakumbi iyafuneka kwimiba ekhethekileyo enxulumene nolawulo lwexesha elide nokwakheka komhlaba wokulahla iHLW. Isishwankathelo

seemfuneko ezamkelekileyo zezizwe zokulahla ngokwakheka komhla zisekiwe kutshanje. (IAEA, 2006d). Ezi mfuneko kufuneka zihlonyelwe ukuvela kumava eenkqubo zesizwe eziliqela ezenzeka kwithuba leminyaka elishumi yokusebenza kwendawo yokulahla yeHLW ngokwakheka komhlaba nezibaso ezisebenzileyo, ngokuqaphelekayo eFinland, eSweden, naseMelika.

- Iimpembelelo ezinokubakho kokusingqongileyo ezichongiweyo zavavanywa ziquka zonke iintlobo ezinokwenzeka zeenkunkuma zokusasazeka ngemitha ekulindelwe ukuba ziveliswe sisiKhululo saMandla seNyukliya yeNyukliya-1 esicetywayo. Iziphumo zovavanyo zibonisa ukuba ngokusebenzisa onke amanyathelo okunciphisa afanelekileyo zonke iimpembelelo ezinokubakho ziphantsi.

1.29 UHlolo lweNgozi zokuHamba kobuTyobo (Appendix E30)

INgxelo yokuQala

Olu phononongo lwengcali luphanda ukuhamba kobutyobo okusolwayo kunye neediphozithi zokuhamba kobutyobo obungena kuMlambo i-Sand River, intlabathi entsakantsaka emanzi kunye naziphi na iinkqubo ezikhupha ulwelo kwintlabathi, izikhukula zikaNovemba 2007 ezonakalisa u-R330 kwilali yase-St. Francis Bay kunye nokuba nokwenzeka kobukho bezikhukula apho u-R330 anqumla khona uMlambo i-Sand. Le miba yaphakanyiswa kwintlanganiso yeengxoxo engundoqo nabantu ekusetyenziswana nabo eyayibanjwe e-St. Francis Bay ngowama-25 Meyi 2010 njengenxenye ye-EIA yesikhululo samandla senyukliya (‘Nyukliya-1’) eso i-Eskom iceba ukusakha.

Iintsongelo zinokuba khona zokuba iziganeko ezinjalo ezinokuba nazo kwisikhululo samandla enyukiliya esinokuba khona kunye nezakhiwo ezinxulumene naso kwisiza sase-Thyspunt zihloliwe. Okufunyanisiweyo kuphando kuthiwe thaca kule Ngxelo isisiHlomelo kwiNgxelo yoPhononongo lweMpawu zoMphezulu woMhlaba.

Uncwadi olufumanekayo kumxholo zaye zajongwa, kuqukwa neengxelo ezahlukeneyo ezilungiswe yi-Eskom. Abahlali bengingqi abohlukeneyo kunye ngeengcali zokusingqongileyo kwaye kwadityanwa nabo. Imaphu eziphawulwe ngemigca ezibonisa amanqanaba elwandle nasemhlabeni kunye neefoto zomhlaba ezithathwe ngumntu ephezulu ukusukela kowe-1942 ukuya kowama-2007 zaye zahlalutywa ukuphanda ukuziphatha koMlambo i-Sand kunye neendlela zokugeleza kamanzi esikhukula.

Ukuhamba kobutyobo kunye neediphozithi zobutyobo nobuhambileyo

Akukho ukuhamba kobutyobo kunye nentlenge yzobutyobo obuhambileyo kuMlambo i-Sand. Ayikho eminye imiqathango yokusingqongileyo kumandla we-Cape St. Francis evumela ukwakheka kokuhamba kobutyobo. Yiloo nto ukuhamba kobutyobo kungeke kube yintsongelo enokuba khona kwisikhululo samandla enyukiliya esinokuba khona kunye nezakhiwo ezinxulumene naso kwisiza sase-Thyspunt.

Intlabathi emanzi entsakantsaka kunye naziphi na iinkqubo ezikhupha ulwelo entlabathini

Intlabathi emanzi entsakantsaka kaninzi yenzeka kwithafa lengqumba yentlabathi lase-Oyster Bay. Yenzeka kakhulu xa intlabathi entsakantsaka edibeneyo igcwele amanzi.

Izithuthi ngeke zitshone kwintlabathi emanzi entsakantsaka kwithafa lengqumba yentlabathi e-Oyster Bay ngaphandle kokuba zihamba kunxweme loMlambo i-Sand okanye zijikeleza amachibi aphakathi kwiingqumba zentlabathi. Izithuthi ezihamba ku-R330 azikho kuyo nayiphi na ingozi yokutshona kwintlabathi emanzi entsakantsaka.

“Indlela engena empuma” ecetywayo eza kunqumla iingqumba zentlabathi ezilinyiweyo kunye nemigxobhozo iza kwakhiwa ukulungisa imiba yobunjineli ukuze incede naziphi na iimeko zokungakheki kakuhle kwesiseko ukuze izithuthi ziyisebenzise ngokukhuselekileyo indlela. Isikhululo samandla senyukliya esinokuba khona siya kwakhiwa kwilitye eliqinileyo ukuze intlabathi emanzi entsakantsaka kunye naziphi na iinkqubo ezikhupha ulwelo kwintlabathi zingabi nazo naziphi na iimpembelelo kuso.

Izikhukula zikaNovemba 2007

NgoNovemba wama-2007 isikhukula esonakalisa i-R330 siqikelelwa ukuba sisiganeko sonyaka sesi-1:200. Umonakalo omkhulu wokhukuliseko, wawusisiphumo sokukhukuliseka kweentlenga ngamanzi esikhukula ahamba, esehla kumjelo ongu-V omqengqelezi ngaku-R330. Umonakalo wadalwa kananjalo kukulahlwa kwentlenga kummandla we-R330 ngakwi-Lyme Road ukungena kwindawo ekufutshane ne-St. Francis Bay Golf Course. Intlenga eyimilo yefeni, hayi intlenga yokuhamba kobutyobo.

U-Ninham Shand uphakamise uphuculo ekukhutshweni kwamanzi esiphango oko okunokwehlisa kakhulu amathuba okuba kwenzeke umonakalo onjalo kwakhona. Olunye lolu phuculo luqalisiwe.

Ukuba nobukho bomonakalo wezikhukula apho u-R330 anqumla uMlambo i-Sand

U-R330 unqumla uMlambo i-Sand River udlula kwikholveti eyakhiwa xa kwakusakhiwa kwakhona indlela ukuze ibe kulo mgangatho ikuwo ngoku ngo-1989/1990. Owona monakalo mkhulu ku-R330 ukusukela ngoko yaba zizikhukula zikaNovemba 1996, xa iindonga ezikwicala ngalinye lekholveti zoonakala yaye kwabakho ukhukuliseko oluthile lomphezulu ofakwe itela wonakaliswa ngamanzi ahamba phezu kwendlela. Indlela yayisebanzi ngokwaneleyo, ukwamkela isiphithiphithi sokuhamba kwetrafiki ukuya kumacala amabini. Ezinye izikhukula zadala umonakalo onganeno okanye awabikho umonakalo.

Yiloo nto ke u-R330 onakaliswe zizikhukula eziliqela zoMlambo i-Sand kodwa umonakalo ube mncinci kuba, ukufikelela kwezithuthi akuzange kuphazamiseke. Kwenziwa isincomo sokuba ikholveti yomelezwe xa kukho imfuneko, ilondolozwe kakuhle, ihlolwe rhoqo ukujonga ukuba akukho ntlabathi ivingcileyo; yaye nabuphi ubutyobo obubambeke ngokunqamlezileyo ngexesha lezikhukula bususwe.

INgxelo yesiBini (isihlomelo kuHlolo lweNdlela yokuNgena e-Thyspunt)

Olu phononongo lweengcali sisiHlomelo sesibini kwiNgxelo yoPhononongo lweMpawu zoMphezulu woMhlaba. Luphanda iindlela ezintsha zokungena ezisentshona kwisiza sase-Thyspunt, kunye nezikhukula zika-2011–2012.

Ithisisi ye-MSC ka-Lauren Elkington yagqitywa ngoJuni 2012. Imele isimo sangoku sophando oluqhutywa nguNjingalwazi Ellery weYunivesiti yase-Rhodes kunye nabo

asebenza nabo. Le thisisi yaqwalaselwa kwakhona kwaye ulwazi olubalulekileyo lufakiwe kule ngxelo.

Uncwadi olufumanekayo kumxholo zaye zajongwa, kuqukwa neengxelo ezahlukeneyo ezilungiswe yi-Eskom. Utyelelo kwiziza lwenziwa. Iirekhodi zemvula zajongwa. Abahlali bengingqi abohlukeneyo kunye ngeengcali zokusingqongileyo kwaye kwadityanwa nabo. Imaphu eziphawulwe ngemigca ezibonisa amanqanaba elwandle nasemhlabeni kunye neefoto zomhlaba ezithathwe ngumntu ephezulu ukusukela kowe-1942 ukuya kowe-2012 zaye zahlalutywa ukuphanda ukuziphatha koMlambo i-Sand. I-GIS yasetyenziswa ukudala imphezulu yomhlaba yedijithali yedatha nemifanekiso yeempawu ezibonakalayo zommandla.

Uphononongo lokudibana nokulungiswa kweempawu ezibonakalayo zomgangatho wolwandle kumathafa eengqumba zentlabathi kwindlela eyenye enokusetyenziswa kwiNdlela eMxinwa engena elwandle yase-Cape St. Francis

Iingqumba zentlabathi zendlela eyenye ekunokuhanjwa ngayo kwindlela emxinwa engena elwandle e-Cape St. Francis isusiwe kwiibhitshi zayo eziyimithombo ngenxa yemisebenzi yabantu. Ukuba alukho ungenelo lwabantu olubanga oku (ngaphandle kokuzinzisa ummandla wengqumba zentlabathi kwibhitshi yase-Oyster Bay), amathafa eengqumba zentlabathi ayakuzinza ngokucotha kwi-1 000 leminyaka elizayo okanye ngeeknqubo zendalo zokukhula kwezityalo kunye nokusasazeka okuqhubayo okungamandla kwezityalo zangaphandle.

Ukuba ingqumba yentlabathi ngakunxweme lweLali yase-Oyster Bay ivunyelwe ukuba isuke ize ingene kwilali, ummandla owondlayo uya kubuyela kwisimo sawo sendalo kwaye ekugqibeleni uya kuqala ukondlela intlabathi kwithafa lengqumba yentlabathi. Nakuba kunjalo, ukuba le ngqumba yentlabathi iyalawulwa kwaye ayivunyelwa ukuba ihlangane, ukungena kwentlabathi kwithafa lentlabathi kuya kuhlala kungangeni. Lo ngumzekeliso onokwenzeka.

Ukuba iintlobo zezityalo zangaphandle ezingenelelayo ezifana ne-rooikrans ziyasuswa, ukukhula kwakhona kwezityalo zendalo kuya kucotha, amathafa eengqumba zentlabathi aqhubekayo ayakukhawuleza ukuhamba, kwaye ilahleko yeengqumba zentlabathi ezisukayo ngenxa yokungenelalare kwezityalo zangaphandle kuya kuyeka. Amathafa eengqumba zentlabathi aya kubuyela ekusukeni kwawo kwendalo.

Kuthelekelelwa ukuba xa iintlobo zezityalo zangaphandle ezingenelelayo zihlala zikhangelwa kwiziphelo ezisempuma zamathafa eengqumba zentlabathi ziya kuqhuba ngokwamazinga azo embali, njengokuba ulwimi olukhokelayo lwamathafa eengqumba zentlabathi luya kuyela kwicala elisempuma ngamazinga e-10 ukuya kuma-30 m/yr, kwaye iziphelo ezilandelayo zamathafa eengqumba zentlabathi ziya kuqhuba zivela izityalo malunga ne-5 m/yr.

Indawo ekuyo kunye nobunjani bayo imigxobhozo kwimimadla yeengqumba zentlabathi itshintshe kakhulu kubomi bamathafa eengqumba zentlabathi, okungqinelana nendlela yokutshintsha kwazo. Indawo enkulu yemimandla esebenzayo yeengqumba zentlabathi iphelile ngenxa yeempembelelo ezingabantu; amanani emigxobhozo ephakathi kweenguqmba zentlabathi yehle ngokungqinelanayo.

Uhlolo lweendlela zokungena kuso sonke isiphelo esisentshona sethafa lengqumba yentlabathi esukayo lwase-Oyster Bay

Iimpembelelo zinyinelwe kwimiba enxulumene nengqumba zentlabathi ezisukayo. Iindlela ezicetywayo zinqumla iziphelo ezidlula (entshona) kwiipetshi zamathafa eengqumba zentlabathi ezisukayo, apho ukusuka kweengqumba zentlabathi kuhamba kancinane. Iingqumba zentlabathi ezisukayo ziya ngakwiintlambo eziya kugcwaliswa ukuze kwakhiwe iindlela. Xa kunjalo indlela enye enokusebenza iya kuba kukuzinzisa iipetshi zengqumba zentlabathi ezsukayo ziye entshona (ngokuchasene necala eliya umoya) kwiindlela ezicetywayo. Iziphumo ezingundoqo zoku iya kuba kukuphulukana nommandla omcinane weengqumba zentlabathi. Iimpembelelo zokusingqongileyo ziya kuba sezantsi.

Njengendlela yokunciphisa, i-Eskom iyavuma ukubuyisela iingqumba zentlabathi ezisukayo ezimi kumhlaba wayo okwithafa lengqumba yentlabathi ese-Oyster Bay ngokususa izityalo zangaphandle. Ummandla omkhulu kunalowo ubunokuzinziswa unokuphinde uhlanganiswe.

Uhlolo lweendlela zokungena kuzo zonke iingqumba zentlabathi ezityaliweyo oyinxenye kunye nemimandla ephumileyo yeengqumba zentlabathi ongqalileyo

Oku kuphathelene nokunqumla iingqumba zentlabathi ezindlela ekunokufuneka ukuba yohlulwe kwaye igcwaliswe ukuze kwakhiwe indlela enokonyuka okusulungekileyo. Iibloko zokubamba okanye iibloko ezifana nazo kufuneka zisetyenziswe ukuzinzisa amacala awohluliweyo kwaye agcwaliswa, kuba ukubuyisela kwisimo sangaphambili ngokutyala kumathambeka kuya kuba nzima kwaye kucothe. Ke ngoko kuya kuba khona iziphumo ezincinane kuzinzo kwengqumba zentlabathi, ngaphandle nje komngcipheko wokwehla ngesigaba sokwakha. Iimpembelelo zokusingqongileyo ziya kuba sezantsi.

Izikhukula zika-2011 kunye no-2012 kunye noMlambo i-Sand

Izikhukula zesiquphe kwingingqi zibangwa ziingqumba zentlabathi ezisukayo ezivala umjelo woMlambo i-Sand kwithafa lengqumba yentlabathi ngexa lamathuba awomileyo. Xa uphuphuma kwakhona umlambo, amanzi aye enze amachibi kwiingqumba zentlabathi de amachibi aphakathi kwengqumba yentlabathi aphuphume kwaye agqabhuke, ebanga izikhukula zesiquphe eziyintlekele kwingingqi. Izixa ezikhulu zentlenga kunye nezityalo zinokuthwala kukugeleza kwamanzi okuphezulu okunamandla.

Isiganeko se-Santareme sowe-15 Septemba 2012 sinika umzekelo obonakalayo wesikhukula sesiquphe okunokwenzeka xa kugqabhuka ichibi elikwingqumba yentlabathi. Eli thafa lengqumba yentlabathi lizinziswe ngokwenziweyo, oko kulondoloza iimpawu zendalo nezenziweyo zeengqumba zentlabathi ezinqamlezileyo ezo umphezulu wedama uphuma kuzo. Ukuma kwamanzi kukhokelele ekugqabhukeni kwelinye lala machibi.

Kuyenzeka rhoqo ukuba singabikho isiganeko esinye semvula enkulu, kodwa kubekho iziganeko ezincinane ezininzi. Impawu ezibonakalayo zomhlaba ziye zigcwale amanzi ngokuqhubekayo, kude kubekho amandla okufunxa amancinane, uze umlinganiselo wokukhupha amanzi wonyuke. Isiganeko semvula se-100 mm okanye okunjalo

ekupheleni kwexesha lonyaka elinethayo linokwenza izikhukula ezikhulu ezinokubanga umonakalo omkhulu. Oku kwenzeka ngo-2011 kunye no-2012.

Esona siganeko sikhulu ngo-2011 yaba li-123 mm ngo-2/3/4 Julayi. Emva kwemvula, umthamo omkhulu wamanzi waye wonyuka kwimpulo yolwimi olukumazantsi lwethafa yengqumba yentlabathi ese-Oyster Bay; ukugeleza kwaye kwandiswa ngumjelo wokukhupha amanzi. Ulwimi olukumazantsi lwagqajuzwa ngokungekuko okwendalo ngowe-7 Julayi. Ikholvethi yoMlambo i-Sand yaye yakhukuliswa kwizikhukula zesiquphe, yaze ideltha ekuMlambo i-Sand kwichweba lomlambo i-Kromme lafumana malunga nama-80 000 m^3 entlenga.

Isiganeko sokugqibela semvula sika-2012 yayisesona siganeko sikhulu kuloo nyaka: i-113 leemililitha zanetha ukusukela kowe-17 ukuya kowama-20 Oktobha. Yakhokelela kwizikhukula ezakhukulisa ikholvethi yexeshana yoMlambo i-Sand River eyayakhiwe ngo-2011.

UMlambo i-Sand ukhukulisa iingqumba zentlabathi kwindlela yawo eya kwithafa lengqumba yentlabathi, ithatha intlabathi eninzi. Izixa ezikhulu zentlabathi ngokunjalo nentsalela yezityalo zithwala zehle uMlambo i-Sand ngexa lezikhukula. Le yinkqubo eqhelekileyo yemilambo, hayi ukukhukuliseka kobutyobo. Intlabathi ekugqibeleni ihlala kwideltha yoMlambo i-Sand River kwichweba lomlambo i-Kromme. Oku bekusenzeka amakhulu eminyaka.

Ideltha yoMlambo i-Sand kwiChweba lomlambo i-Kromme

Ichweba lomlambo i-Kromme luhlobo oluthathwa yintlabathi. Intlabathi ithathwa kuMlambo i-Sand kunye nakwimisinga yokuzala nokurhoxa kolwandle ethwala intlabathi iyise kwichweba lomlambo iyisusa elwandle. Idelta yoMlambo i-Sand ayikaze ivale ichweba lomlambo i-Kromme ngokupheleleyo, kwaye akubonakali ngathi ingakwenza oko.

Ubutyobo ekucingelwa ukuba bunokuhamba

Ukuhanjiswa okucingelwayo kobutyobo yintlenga edudulayo.

Izincomo

Izityalo zangaphandle kulo lonke ithafa lengqumba yentlabathi kufuneka kuthathwe iinkcukacha zazo ukuqinisekisa nokuphucula imizekeliso eqikelelwayo kutshintsho lwamathafa eengqumba zentlabathi exa elizayo.

Amachibi angaphakathi kwiingqumba zentlabathi kufuneka ahlolwe ngexa leemvula ezinkulu ukuze kubonwe xa kuvela izimo ezinobungozi. Amaphando aphezulu enziwa ngenqwelomoya encianane yeyona ndlela ifanelekileyo yokwenza oku.

Ikholveti yexeshana yoMlambo i-Sand kufuneka itshintshwe ngesakhiwo esifanelekileyo esiyilelwe isigxina.

1.30 UHlolo lweNdlela yokuNgena e-Thyspunt W1W4 (Appendix E31)

Ngenxa yeentlanganiso zikawonke-wonke ezabanjwa eMpuma Koloni ngo-2011 njenenxenye yoHlolo lweeMpembelelo zokusiNgqongileyo (Environmental Impact Assessment) (EIA) kwiNyukliya-1 ngokunjalo nezimvo ezifunyenwe kumaQela anoMdla naChaphazelekayo ngendlela ezizezinye ngeendlela zasentshona zokungena kwisiza sase-Thyspunt, amaphononongo awongezelelweyo eengcali aye anikwa umyalelo wokuba aphande ngokhetho lwendlela zokungena kunye neempembelelo zazo kwizimo ezingqongileyo eziphathelene nomzimba, intlalo kunye noqoqosho.

Amaphononongo aquka amaphando omsebenzi owenziwa ngaphandle kunye nokubhalwa kwengxelo okulandelayo ziingcali zeeNzululwazi ngezityalo kunye noNxulumano lwezinto eziphilayo kwiiNgqumba zeNtlabathi, ezokuDibana kweziNto eziPhilayo ngokwebhayoloji kumaNzi afreshi, ezonxulumano lwezinto eziphilayo lweziLwanyana ezinemiqolo kunye nezingenayo imiqolo, ezophononongo lweeMpawu ezikumphezulu womhlaba kunye nezaMafa. Izimvo ezixhasayo zophononongo ngolwazi lweprojekthi yokwakha zaye zathathwa kwiiNgcali zezasekuHlaleni, ukuBona, iNgxolo, ezoQoqosho kunye nezeeNzuluwazi zamanzi aphantsi komhlaba nezoBunjani beeMathiriyeli zoMhlaba.

Iindlela ezizezinye ezibekelwe uphando liqela leengcali zichazwe njengoku kulandelayo kwaye zibonakaliswe ngumfanekiso ongezantsi:

- Indlela yokuqala yonxweme, enezinye iindlela ezizezinye ekupheleni, phakathi kwe-Umzamawethu ne-Oyster Bay (CR-1 + CR-2 + CF/CE/CD)
- Indlela eselunxwemeni engena emhlabeni, kwimpuma ye-Umzamawethu (CR-1 + IR-1)
- Indlela ephakathi emhlabeni ekwangena kwimpuma ye-Umzamawethu (IR-1 + IR1-1 okanye IR1+IR-1-2).

INDLELA YOKUJONGANA NOPHONONONGO

Ingcali nganye ebinikwe umsebenzi wokuhlola iindlela yokungena kwicala elisentshona kwisiza sase-Thyspunt ijongene nalo msebenzi ngokwenkalo yayo yophononongo ngokweendlela ezisetyenzisiweyo kuphando lwezenzululwazi. Intlanganiso yokuqalisa neqela nakuba kunjalo yaqhutywa phambi kokuba kuqale umsebenzi wangaphandle ngowama-20 Novemba 2012. Injongo yentlanganiso yokuqalisa yayikukunika isishwankathelo esifutshane ngokophando lwangaphambili olunxulumene nesiza ngokunjalo nokuqinisekisa isikowupu sokusebenza kusiyiwa phambili kunye nokulungelelanisa imisebenzi kwinkalo le. Intlanganiso yokuvala yabanjwa ngowama-22 Novemba 2012. Iziphumo zengxelo zeengcali ngazodwa zidityaniswwe zaba yile ngxelo iyiyo ngoku.

ISISHWANKATHELO SEMPEMBELELO

Isishwankathelo sokubaluleka kweempembelelo njengoko zichongiwe ziingcali ngazodwa lukhona okanye lungekho uncitshiso sinikwe kwitheyibhile engezantsi.

ISishwankathelo sokuBaluleka kweeMpembelelo lukhona okanye lungekho uncitshiso

IIMPEMBELELO	UKUBALULEKA
IIMPEMBELELO KWIMITHOMBO YENZULULWAZI NGEZITYALO KUNYE NONXULUMANO PHAKATHI KWEZINTO EZIPHILAYO NENDAWO EZIPHILA KUYO KULUNGELELWANISO LWENDLELA ECETYWAYO YOKUNGENA ENTSHONA	
Ukuphela kwekhaya elisenxwemeni lezilwanyana kunye nezityalo (CR-1)	
Ezingancitshiswanga – Ukuphela kwe-fynbos neqela lamatyholo okanye imithi exineneyo	**Phakathi**
Ezincitshisiweyo – ukulungelelanisa ukuphepha umgangatho olungileyo wezityalo (akukho kunciphisa ukuphela ngqo kwekhaya lezilwanyana okanye izityalo, kodwa kunokuphepha iziza ezikumgangatho olungileyo kunye nezinqabileyo)	**Phantsi**
Ukuphela kwengqumba zentlabathi ezisenxwemeni (CR-1/CR-2)	
Ezingancitshiswanga – Ukuphela kweengqumba zentlabathi ezizinzileyo eziyinxenye yezinye, amatye ekalika asenxwemeni	**Phezulu**
Ezincitshisiweyo – ukulungelelanisa kude namatye ekalika, ukuphepha amathambeka anyukayo ayinxenye namanye	**Phantsi**
Ukuphela kwehlathi lonxweme (IR-1/IR-2)	
Ezingancitshiswanga – Ukuphela kweepetshi zehlathi kwiingqumba zentlabathi eziyinxenye nezinye	**Phezulu**
Ezincitshisiweyo – ukulungelelanisa kude nehlathi, okukhethekayo lungenelelo lwe-acacia	**Sezantsi**
Ukuphela kokuphuma kolwelo kwiingqumba zentlabathi ezinqamlezileyo nangasentla kwe-Slangrivier (IR-1/IR-2)	
Ezingancitshiswanga – Ukuphela kolwelo ngasendleleni	**Phezulu**
Ezincitshisiweyo – ukulungelelanisa kwakhona ukuphepha ulwelo oluphumayo	**Phakathi**
Ukuphela kwamatyholo namahlathi axineneyo e-Slangrivier (IR-1/IR-2)	
Ezingancitshiswanga – Ukuphela kwenxenye ezityalo kunye nokusebenza komlambo	**Phezulu**
Ezincitshisiweyo – ibhulorho phezu komlambo ukuphepha amatyholo kunye nehlathi elixineneyo; ukulungelelanisa apho kuphele khona izityalo	**Phantsi**
Ukuphela kwentlobo zezityalo ezikwiDatha eBomvu (zonke iindlela)	
Ezingancitshiswanga – Ukuphela kweentlobo zezityalo ezikwiDatha eBomvu ngasendleleni	**Phakathi**
Ezincitshisiweyo – ukulungelelanisa mhlawumbi ukuphepha iintlobo zezityalo okanye ukuzifudusela kwindawo ekhuselekileyo	**Phantsi**
Ukuphela kwamatyholo namahlathi axineneyo e-Slangrivier (IR-1/IR-2)	
Ezingancitshiswanga – Ukuphela kwenxenye ezityalo kunye nokusebenza komlambo	**Phezulu**
Ezincitshisiweyo – ibhulorho phezu komlambo ukuphepha amatyholo kunye nehlathi elixineneyo; ukulungelelanisa apho kuphele khona izityalo	**Phantsi**
Ukuphela kokusebenza kwezinto eziphilayo kunye nendawo eziphila kuyo (IR-1/IR-2)	
Ezingancitshiswanga – Ukufaka emngciphekweni ukusebenza kweengqumba zentlabathi ezinqamlezileyo kunye nokusebenza kolwelo lomhlaba lwethambeka lenduli.	**Phezulu**
Ezincitshisiweyo – ukulungelelanisa kwakhona kude nalapho kuphuma khona ulwelo.	**Phakathi ukuya Phezulu**

IIMPEMBELELO	UKUBALULEKA
Iimpembelelo ezandayo	
Ezingancitshiswanga – Ukuphela kweentlobo zezityalo, ikhaya lazo kune nokusebenza kwezinto eziphilayo nendawo eziphila kuyo	**Phezulu**
Ezincitshisiweyo – kunzima ukunciphisa ngokupheleleyo, kodwa apho kwenzekayo indlela mayakhiwe kude neengqumba zentlabathi ezisukayo kunye nemigxobhozo	**Phakathi ukuya Phezulu**
UHLOLO LWEEMPEMBELELO KWIMIGXOBHOZO NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
ISigaba soKwakha: Ukuphela okanye ukwehla kolwelo lonxweme, umzantsi wentlambo kunye nemigxobhozo ejikelezwe yimihlaba ephakamileyo, ngenxa (phakathi kwezinye izinto) yokugcwala, utshintsho ekuphumeni, ukwehla kwentlenge, ukuphazamiseka kwizityalo, umgangatho ombi wamanzi	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
ISigaba sokuSebebenza: Ukuphela okanye ukwehla kolwelo lonxweme, umzantsi wentlambo kunye nemigxobhozo ejikelezwe yimihlaba ephakamileyo, ngenxa (phakathi kwezinye izinto) yokugcwala, utshintsho ekuphumeni, ukwehla kwentlenge, ukuphazamiseka kwizityalo, umgangatho ombi wamanzi, ukutshintshwa kwendlela yokuhamba, ukuphela komsebenzi wezinto eziphilayo kunye nendawo eziphila kuyo (utshintsho kwinkqubo eguqukayo); ukuphela kokuhlangana, ukohlulwa kwendawo yokuhlala ngokwamacandelo: Nceda uqaphele ukuba iziphumo zokwahlula ngokwamacandelo ekupheleni kokudibana ngamacandelo kusetyenzwa ngako kumahlolo olungiselelo olungalodwa.	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
IIMPEMBELELO EZINXULUNYANISWA NOLUNGISELELO: **Iimpembelelo ziquka: ukuphela kwendawo yokuhlala esemgxobhozweni, ukuphela kokudibana, ukohlulwa kweendawo zokuhlala, ukwehla kwinkqubo yenqanaba; utshintsho kwingququko yeengqumba zentlabathi okuchaphazela ubomi obahlukeneyo ingakumbi kwiindawo zezityalo nezilwanyana nesimo semigxobhozo**	
- INdlela eseNxwemeni (CR-1 & CR-2): I-NPS ukuya kwi-Humansdorp Road, phakathi kwe-Oyster Bay kunye ne-Umzamawethu; iindlela ezizezinye ezintathu kwisiphelo esisentshona: A-B-C-D/E/F	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
- INdlela ePhakathi 1 (IR-1): NPS ukuya kwintshona ye-Umzamawethu: G-H-I	
Ezingancitshiswanga	**Phezulu Kakhulu**
Ngokunciphisa okumiselweyo	**Phezulu**
- INdlela ePhakathi 2 (IR-2): NPS ukuya kwintshona ye-Umzamawethu: G-H-J	
Ezingancitshiswanga	**Phezulu Kakhulu**
Ngokunciphisa okumiselweyo	UKUNCIPHISA KOKUPHEPHA: Jonga iindlela ezizezinye eziNcitshisiweyo kwiNdlela eseNxwemeni kunye nakwiNdela eseMhlabeni -1
INdle eseNxwemeni ukuya kweseMhlabeni 1, eyenye 1 (CR-1 to IR-1): A-B-K-I	
Ezingancitshiswanga	**Phezulu Kakhulu**
Ngokunciphisa okumiselweyo	UKUNCIPHISA KOKUPHEPHA: Jonga iindlela ezizezinye

IIMPEMBELELO	UKUBALULEKA
	eziNcitshisiweyo kwiNdlela eseNxwemeni kunye nakwiNdela eseMhlabeni -1
INdlela eseNxwemeni ukuya kweseMhlabeni 2, eyenye 2 (CR-1 to IR-2): A-B-L-J	
Ezingancitshiswanga	**Phezulu Kakhulu**
Ngokunciphisa okumiselweyo	UKUNCIPHISA KOKUPHEPHA: Jonga iindlela ezizezinye eziNcitshisiweyo kwiNdlela eseNxwemeni kunye nakwiNdela eseMhlabeni -1
UHLOLO LWEEMPEMBELELO KWIZILWANYANA EZINGENAMQOLO NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
Ukuphela kunye nokutshintsha kwendawo ehlala izilwanyana ezingenamqolo ngenxa yokwakhiwa kwendlela ecetywayo yokungena	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukwehla kwendawo ehlala izilwanyana ezingenamqolo ngenxa yokwakhiwa kwendlela ecetywayo yokungena	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukohlulwa kwendawo ehlala izilwanyana ezingenamqolo ngenxa yokwakhiwa kwendlela ecetywayo yokungena	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Sezantsi**
Ungcoliseko lwamanzi lwendawo engumgxobhozo ehlala izilwanyana ezingenamqolo ngenxa yokwakhiwa kwendlela ecetywayo yokungena	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phakathi**
Ungcoliseko lwamanzi lwendawo engumgxobhozo ehlala izilwanyana ezingenamqolo ngenxa yomsebenzi wendlela ecetywayo yokungena	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
UHLOLO LWEEMPEMBELELO KWIZILWANYANA EZINOMQOLO NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
INdlela eyeNye W1, W2, W3	
Ukuqhutywa kwepaseji emxinwa **Ipaseji emxinwa yonxulumano lwezinto eziphilayo kunye nendawo eziphila kuyo inokuphazanyiswa xa izakhiwo ezisisigxina zisakhiwa kwindawo yezilwanyana nezityalo esebenzayo**	
Ezingancitshiswanga	**Phantsi**
Ngokunciphisa okumiselweyo	**Phantsi Kakhulu**
Ukohlulwa kweendawo ezithile zezityalo nezilwanyana – lindawo ezithile zezilwanyana kunye nezityalo zinokukhetheka zibe zodwa kwezinye ngenxa yezakhiwo ezisisigxina, okanye ukuba indawo ehlala izilwanyana nezityalo incinane kwaye yohlulwe ngokowamacandelo, la macandelo ngeke abesakwazi ukusebenza ngokwezinto eziphilayo kunye nendawo eziphila kuyo	

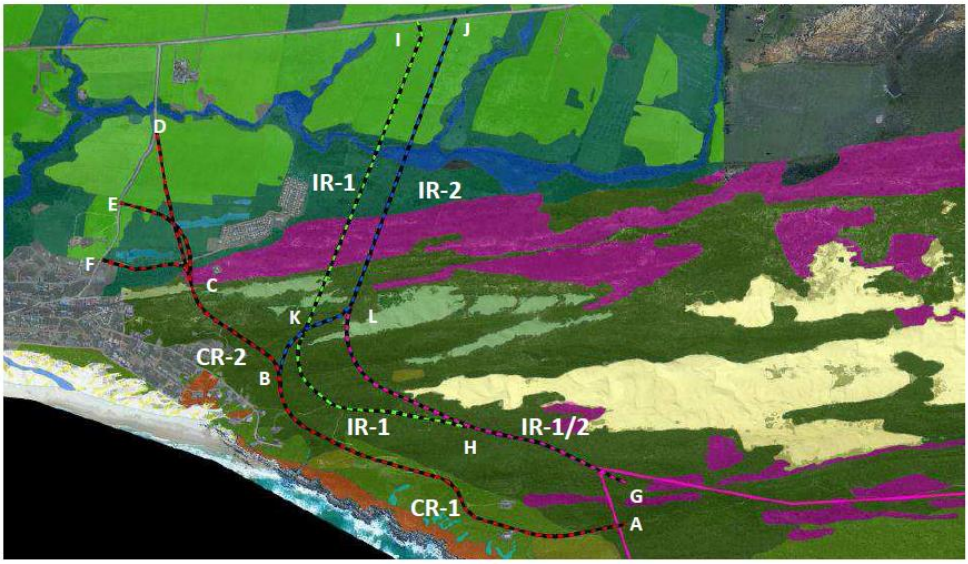
IIMPEMBELELO	UKUBALULEKA
Ezingancitshiswanga	**Phantsi**
Ngokunciphisa okumiselweyo	**Phantsi Kakhulu**
INdlela eyeNye W4	
Ukuqhutywa kwepaseji emxinwa **Ipaseji emxinwa yonxulumano lwezinto eziphilayo kunye nendawo eziphila kuyo inokuphazanyiswa xa izakhiwo ezisisigxina zisakhiwa kwindawo yezilwanyana nezityalo esebenzayo**	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phantsi Kakhulu**
Ukohlulwa kweendawo ezithile zezityalo nezilwanyana – lindawo ezithile zezilwanyana kunye nezityalo zinokukhetheka zibe zodwa kwezinye ngenxa yezakhiwo ezisisigxina, okanye ukuba indawo ehlala izilwanyana nezityalo incinane kwaye yohlulwe ngokowamacandelo, la macandelo ngeke abesakwazi ukusebenza ngokwezinto eziphilayo kunye nendawo eziphila kuyo	
Ezingancitshiswanga	**Phantsi Kakhulu**
Ngokunciphisa okumiselweyo	**Phantsi Kakhulu**
Ukufa kwezilwanyana ezinomqolo ezindleleni – Ukuhamba rhoqo kweelori/izithuthi endleleni kuya kukhokelela ekufeni kwezilwanyana ezinomqolo	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukutshatyalaliswa kwendawo yezityalo nezilwanyana – Ukwakhiwa kweendlela, ukwandiswa kwendlela esele zikhona, ukwakhiwa kweebhulorho, kunye nokucocwa kwesiza kuya kutshabalalisa indawo esele zikhona ezihlala izilwanyana nezityalo	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
INdlela eyeNye W5 (entsha)	
Ukuqhutywa kwepaseji emxinwa **Ipaseji emxinwa yonxulumano lwezinto eziphilayo kunye nendawo eziphila kuyo inokuphazanyiswa xa izakhiwo ezisisigxina zisakhiwa kwindawo yezilwanyana nezityalo esebenzayo**	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phantsi**
Ukohlulwa kweendawo ezithile zezityalo nezilwanyana - lindawo ezithile zezilwanyana kunye nezityalo zinokukhetheka zibe zodwa kwezinye ngenxa yezakhiwo ezisisigxina, okanye ukuba indawo ehlala izilwanyana nezityalo incinane kwaye yohlulwe ngokowamacandelo, la macandelo ngeke abesakwazi ukusebenza ngokwezinto eziphilayo kunye nendawo eziphila kuyo	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukufa kwezilwanyana ezinomqolo ezindleleni – Ukuhamba rhoqo kweelori/izithuthi endleleni kuya kukhokelela ekufeni kwezilwanyana ezinomqolo	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukutshatyalaliswa kwendawo yezityalo nezilwanyana – Ukwakhiwa kweendlela, ukwandiswa kwendlela esele zikhona, ukwakhiwa kweebhulorho, kunye nokucocwa kwesiza kuya kutshabalalisa indawo esele zikhona ezihlala izilwanyana nezityalo	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
INdlela eyeNye W5 (endala)	
Ukuqhutywa kwepaseji emxinwa **Ipaseji emxinwa yonxulumano lwezinto eziphilayo kunye nendawo eziphila kuyo inokuphazanyiswa xa izakhiwo ezisisigxina zisakhiwa kwindawo yezilwanyana nezityalo esebenzayo**	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phantsi**

IIMPEMBELELO	UKUBALULEKA
Ukohlulwa kweendawo ezithile zezityalo nezilwanyana – lindawo ezithile zezilwanyana kunye nezityalo zinokukhetheka zibe zodwa kwezinye ngenxa yezakhiwo ezisisigxina, okanye ukuba indawo ehlala izilwanyana nezityalo incinane kwaye yohlulwe ngokowamacandelo, la macandelo ngeke abesakwazi ukusebenza ngokwezinto eziphilayo kunye nendawo eziphila kuyo.	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phantsi**
Ukufa kwezilwanyana ezinomqolo ezindleleni – Ukuhamba rhoqo kweelori/izithuthi endleleni kuya kukhokelela ekufeni kwezilwanyana ezinomqolo	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phakathi**
Ukutshatyalaliswa kwendawo yezityalo nezilwanyana – Ukwakhiwa kweendlela, ukwandiswa kwendlela esele zikhona, ukwakhiwa kweebhulorho, kunye nokucocwa kwesiza kuya kutshabalalisa indawo esele zikhona ezihlala izilwanyana nezityalo	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
UHLOLO LWEEMPEMBELELO KWIMITHOMBO YAMAFA NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
INdlela eyeNye CR-1 (B-A)	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phezulu**
INdlela eyeNye CR-2 (D-B. E-B, F-B)	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phezulu**
INdlela eyeNye IR-1 (I-G)	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phakathi**
INdlela eyeNye IR-2 (J-G)	
Ezingancitshiswanga	**Phezulu**
Ngokunciphisa okumiselweyo	**Phantsi**
UHLOLO LWEEMPEMBELELO KWINGXOLO KWIINDAWO ZOKUHLALA NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
Iimpembelelo ze-IR-1 kwiNgxolo kwiiNdawo zokuHlala ngenxa yemisebenzi yokwakha	
Ezingancitshiswanga	**Phantsi**
Ngokunciphisa okumiselweyo	**Phantsi**
Iimpembelelo ze-IR-2 kwiNgxolo kwiiNdawo zokuHlala ngenxa yemisebenzi yokwakha	
Ezingancitshiswanga	**Phantsi**
Ngokunciphisa okumiselweyo	**Phantsi**
UHLOLO LWEEMPEMBELELO KWIMO ENGQONGILEYO KWINZULULWAZI YENTSHUKUMO, UKUSASAZEKA KUNYE NOMGANGATHIO WAMANZI NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
Intsongelo yokuhamba kwamanzi aphantsi komhlaba ngenxa yokwembiwa kwendlela ngaphantsi kwetafile yamanzi angaphantsi komhlaba – Zonke iiNdlela	**Ngenamsebenzi**
Ukungcoliseka komaleko welitye kukuchitheka ngengozi kwepetroli okanye idizili kunye nemichiza eyingozi – Zonke iiNdlela	
Ngokunciphisa okumiselweyo	**Phantsi**
UHLOLO LWEEMPEMBELELO KWIMO ENGQONGILEYO KWIMISEBENZI YOBUNJINELI EYONAKALISA	

IIMPEMBELELO	UKUBALULEKA
UMGANGATHO WAMANZI NGENXA YOKUPHUNYEZWA KWEENDLELA EZIZEZINYE EZAHLUKENEYO KWINDLELA YOKUNGENA ENTSHONA	
Ukuzisa ungcoliseko lwendawo yemithwalo ngenxa yemfuno yolawulo lwamanzi esiphango ukunciphisa imingcipheko yokhukuliso – Zonke iiNdlela	
Ezingancitshiswanga	**Sezantsi**
Ngokunciphisa okumiselweyo	**Ngenamsebenzi**
limeko ezilambathayo zokufumana eziza nokohlula okugqithisileyo kwiingqumba zentlabathi – Zonke iiNdlela	
Ezingancitshiswanga	**Phakathi**
Ngokunciphisa okumiselweyo	**Phantsi**

ISINCOMO

Ekupheleni kwale ngxelo kukho imibuzo emalunga nokuba yeyiphi indlela ekhethwayo (Jonga umfanekiso ongezantsi ngeendlela ezizezinye ezicetywayo) zokungena kwicala elisentshona kwisiza sase-Thyspun, okwangoku esisiza ekwenziwa isincomo saso ekwakhiweni kunye nasekusebenzeni kweSikhululo samandla seNyukliya-1. Impendulo kulo mbuzo ifuna ukuthelekiswa kweempembelelo zendlela yokungena kwizimo ezingqongileyo kubomi bazo zonke izilwanyana, iintyatyambo, imigxobhozo, iingqumba zentlabathi kunye namafa kunye neempembelelo kubahlali beendawo zase-Oyster Bay nase-Umzamawethu.



1) **Coastal Route** (CR-1 & CR-2): NPS to Humansdorp Road, between Oyster Bay and Umzamawethu; three alternatives at western end: A-B-C-D/E/F
2) **Inland Route 1** (IR-1): NPS to west of Umzamawethu: G-H-I
3) **Inland Route 2** (IR-2): NPS to west of Umzamawethu: G-H-J
4) **Coastal to Inland Route 1, alternative 1** (CR-1 to IR-1): A-B-K-I
5) **Coastal to Inland Route 2, alternative 2** (CR-1 to IR-2): A-B-L-J

Njengoko kuxeliwe ngentla ingcali nganye ibinikwe umsebenzi wokuhlola iindlela zokungena kwicala elisentshona kwisiza sase-Thyspunt ijongene nalo msebenzi

ngokwenkalo yayo yophononongo. Ukhetho lwazo lushwankathelwe kwitheyibhile engezantsi.

INGCALI	CR-1 & CR-2	IR-1 & IR 1/2	IR-2 & IR 1/2	IR-1 & CR-2	IR-2 & CR-2
liNgcali kokuNxulumene neziNto eziPhilayo (Hayi iiNgcali zemiGxobhozo)	**X**				
liNgcali zemiGxobhozo					**X**
liNgcali zaMafa		**X**	**X**		
liNgcali zezeNtlalo			**X**		
liNgcali zokuBona			**X**		
liNgcali zeNgxolo			**X**		

Iindlela eziselunxwemeni eziyi-CR-1 ne-CR-2 zikhethwa zizo zonke iingcali zokunxulumene nezinto eziphilayo neendawo eziphila kuzo, ngaphandle kwengcali yemigxobhozo, yona ekhetha indibaniselwano yendlela engekho nxwemeni engu-IR-2 nenxenye yendlela esenxwemeni engu-CR-2. Iingcali eyamafa, eyezentlalo, eyokubona kunye neyengxolo zonke zikhetha indibaniselwano yendlela ezingekho kunxweme eziyi-IR-1, IR2 no-IR1/2 ngaphezu kwendlela esenxwemeni.

Ngexa ubuthathaka bommandla okuvela kumbono wezinto eziphilayo nendawo eziphila kuyo ungeke uyekwe, kufuneka ubonwe ngokomxholo wommandla osele unazo iimpembelelo kuphuhliso lweendawo zokuhlala (i-Oyster Bay ne-Umzamawethu) kunye nemisebenzi yezolimo (imimandla ebanzi eye kumntla nempuma yezi ndawo zokuhlala). Nangona iingcali zezinto eziphilayo kunye neendawo eziphila kuzo zikhombise iimpembelelo ezimbi ezibaluleke kakhulu kwiintlobo zezityalo ezibuthathaka ukuya kwimpuma ye-Umzamawethu kunye nenxmnye esentshona yethafa leengqumba zentlabathi ezisukayo e-Oyster Bay, ezi mpembelelo kufuneka zithathelwe ingqalelo kumxholo:

- Umlinganiselo wemfuno yoluntu kwizinto eziphilayo nezingaphiliyo emhlabeni weempembelelo zezinto eziphilayo kunye nendawo eziphila kuyo kwindlela ecetywayo zincinane xa kuthelekiswa neempembelelo esele zikhona kule mithombo ekummandla wophononongo; ngokufanayo ububanzi kunye nobukhulu beempembelelo ezibangwa yindlela zincinane xa kuthelskiswa neempembelelo ezibangwa yeminye imisebenzi.
- Amathafa eengqumba zentlabathi ezisukayo e-Oyster Bay ifakwa emngciphekweni luninzi lweminye imithombo ephazamisayo edala iimpembelelo eziphezulu kakhulu nghokubaluleka. UHlolo loPhononongo lweMpawu zoMphezulu woMhlaba weNgqumba zeNtlabathi (Illenberger, 2013) luya zichaza ezi kwaye lukhombisa ukuba nakuba ikhona le mithomnbo iphazamisayo, kunokulindeleka ukuba ithafa lengqumba yentlabathi liqhube ukusebenza kwi-1000 leminyaka ezayo. Ukongezwa kwendlela enerizevu yama-40 eemitha kwisiphelo esisentshona sethafa lengqumba yentlabathi kuya kukhokelela ekupheleni komsebenzi kodwa ke ngeke kutshintshe okanye kuthintele ngokubonakalayo ukususka kwentlabathi.
- Ukususwa kwezityalo zangaphandle okunxulunyaniswa neprojekthi ecetywayo (kwaye esele iqhuba), okwenza ukuhlangana kwakhona kwentlabathi ebiyenziwe yazinza, kuya kubuyekeza ngokungaphaya ukuphela kwemisebenzi ethile yethafa lengqumba yentlabathi apho kucetywa ukuba inqumle khona indlela.

- Nangona indlela iza kunqumla iipetshi zeendawo zezilwanyana nezityala ezibuthathaka kwimpuma ye-Umzamawethu, iqela leengcali lezinto eziphilayo nendawo eziphila kuyo alichonganga zimpembelelo zibulalayo kwezi ndao zezityalo nezilwanyana. Njengasentla, ukusekwa kwendawo yolondolozo ndalo ye-de facto kwisikhululo samandla senyukliya esicetywayo kuya kulondoloza iindawo zezityalo nezilwanyana ezifanayo.

  Yilo nto ke, xa kuthathelwa ingqalelo ezi mpembelelo zezinto eziphilayo nendawo eziphila kuzo kunye neempembelelo zamafa zeendlela ezizezinye zolungelelaniso emhlabeni, kudityaniswe neempembelelo ezibalulekileyo ezinokuba khona kunokusetyenziswa kweendlela ezisenxwemeni ezingu-CR-1 no-CR-2 ebeziza kuba nazo kwimeko zentlalo zase-Oyster Bay nase-Umzamawethu, ukhetho lwendlela esemhlabeni engu-IR-1 kunye no-IR1/2 okanye u-IR-2 kunye no-IR1/2 ziindlela ekwenziwa izincomo zazo zokungena entshona yesiza sase-Thyspunt. **Nakuba kunjalo, xa kuthathelwa ingqalelo yokuba ingcali yemigxobhozo ikhetha u-IR-2, isincomo sokugqibela ngu-IR-2 kunye no-IR-1/2.**

  Ulungelelwaniso olunqamlezileyo nolume nkqo lwale ndlela kwenziwa isincomo sayo sandiswe ziinjineli zase-Eskom ngokunciphisa ukusika nokugcwalisa, oko okunciphisa ngokungaphaya iimpembelelo zokusingqongileyo. Ngokusekelwe kolu hlalutyo, Ukhetho lwesi-4 lwendlela ekwenziwa isincomo sayo (**IR-2 no-IR-1/2**) kwenziwa isincomo salo.

  Onke amanyathelo okunciphisa adweliswe kwicandelo le-4.1.1 lale ngxelo ingakumbi kufuneka liqukwe kwiSicwangciso soLawulo lokusiNgqongileyo lize liphunyezwe ngexa lezigaba zokwakha kunye nokusebenza zeprojekthi.

1.31 UHlolo lweeMpembelelo zoTshiso ngeMitha (Appendix E32)

UMzantsi Afrika ukuthathela ingqalelo ukwakhiwa komzi-mveliso wamandla enyukliya (nuclear power plant) (NPP) enendibaniselwano yeeyunithi zezixhobo ezikhupha umbane onobukhulu bamandla ombane uphelele ongama-4 000 MWe kunye nezakhiwo ezinxulumeneyo. UHlolo lweeMpembelelo zokusiNgqongileyo (Environmental Impact Assessment) (EIA) lwenza ulungiselelo lokwandiswa okunokuba khona lwexesha elizayo lwe-NPP ukuvumela ubukhulu obupheleleyo bamalunga nama-10 000 MWe kwisiza. Kucingelwa ukuba izixhobo zombane zamanzi zokukhanya (light water reactors) (LWR) kwaye ingakumbi izixhobo zamanzi ezinoxinzelelo olulinganisiweyo (pressurised water reactors) (PWR) ze-GEN III ziya kuba bubuchwepheshe obukhethiweyo.

Ukwakhiwa kwale ngxelo kusekelwe kuhlolo lweempbelelo zokusingqongileyo zotshiso ngemitha ezilindelweyo njengoko lufuneka kwibakala lakwangoko lwenkqubo yogunyaziso lwenyukliya ngokomThetho woMlawuli weNyukliya weSizwe (umThetho we-NNR). Le ngxelo, ke ngoko, ayilandeli olona lwakhiwo lwengxelo yengcali ye-EIA njengoko isebenza kuhlolo lweempembelelo zokusingqongileyo zotshiso ngemitha. Ezi ngxelo ziquka intelekelelo ebalulekileyo enxulumeneyo nomlunganiselo kwiimpembelelo zokusingqongileyo ezihlelwa njengeziPhezulu, Phakathi okanye Phantsi, Udidi ngokubaluleka kweempembelelo kuxhomekeka kubunjani, ubukhulu, ububanzi, ixesha, isiphumo kunye nokuba nokuba nethemba lokwenzeka kweempembelelo. Into yokuba iimpembelelo zotshiso ngemitha kunye nohlolo lweziphumo zalo ezandayo kufuneka ukuba zihlangabezane nendlela yolawulo lwe-NNR olusekelwe kwiinkqubo eziqondwayo kwaye ezamkelweyo kumazwe ngamazwe zokhuselo lotshiso ngemitha, kukhokelela ekubalulekeni okuphantsi kweempembelelo zotshiso ngemitha ze-NPP kwimisebenzi

yesiqhelo. Isiphumo seempembelelo ezandayo zotshiso ngemitha apho ngaphezulu kwesibonelelo esinye senyukliya sinokuba neempembelelo ezifanayo kwimo engqongileyo, kufuneka sihlangabezane nethamo ngqo kunye nendlela yomgcipheko olingana neempembelelo ezisezantsi.

Iimpembelelo zotshiso ngemitha ezinokuba khona kuluntu kunye nakokusingqingileyo kwiziza ezithathu ezindululweyo, i-Thyspunt, Bantamsklip, ne-Duynefontein, ziphandwe njengenxenye yohlolo lokuba nokwenzeka kwisiza ngasinye. Uphando luquke le miba ilandelayo:

1) Izinto ezikhutshelwa ngumzi-mveliso wamandla enyukliya zotshiso ngemitha kokusingqongileyo ngexa lemisebenzi eqhelekileyo kunye nethamo kuluntu.
2) Iingozi kumzi-mveliso wamandla enyukliya kunye nomgcipheko wotshiso ngemitha kuluntu.
3) Umngcipheko wotshiso ngemitha kwizityalo kunye nezilwanyana zommndla.
4) Utshiso ngemitha oluhleli lukhona kwiziza ezithathu.

Iziphumo zamaphando kule miba mine zinika impendulo kwimibuzo emine enokuba khona leyo amaqela anomdla nachaphazelekayo anokuba nayo ngokuphathelene nokhuseleko lwenyukliya.

1) *Yeyiphi ingozi yempilo yotshiso ngemitha yokuhlala ecaleni yesinye sezi ziza?*
   Imimiselo yokhuseleko yotshiso ngemitha yoMzantsi Afrika ixela umda wethamo elisebenzayo lonyaka eliyi-1 milli-Sievert (mSv) kwilungu loluntu kuyo yonke imisebenzi egunyazisiweyo ebandakanya inyukliya kunye nemathiriyeli ye-radioactive. Ukuqinisekisa ukuba akugqithwa kumda kwaye amanyathelo okhuselo ayasetyenziswa ukuphumeza ithamo elisezantsi eliphunyezwayo elifanelekileyo (as low as reasonable achievable) (ALARA), umqobo wethamo nawo uyaxelwa kwimithombo engayodwa efana ne-NPP. EMzantsi Afrika, umqobo wethamo yi-0,25 mSv ngonyaka. Ixabiso lomqobo wethamo limele ingozi kwimpilo esezantsi ngokugqithisileyo xa kuthelekiswa nezinto ezikhutshwayo kwimisebenzi eqhelekileyo yemathiriyeli enetyhefu evela kweminye imisebenzi yoshishino. Umqobo wethamo ukwaliqhezu elincinane lethamo lotshiso ngemitha elihleli likhona lendalo le-2,4 mSv ngonyaka, okuphakathi kwihlabathi.

   Uhlolo lwezinto ezikhutshwa yi-radioactive lokusebenza oluvela kokumelwe yimizi-mveliso yamandla enyukliya ye-GEN III lwaqhutywa ngokuthathela ingqalelo iimpawu ngqo zesiza ngasinye kusetyenziswa izimvo zakudala. Ithamo lolawulo le-2,5 mSv ngonyaka kwilungu loluntu kunokuhlangatyezwana nalo kuso ngasinye sezi ziza zithathu.

2) *Uyintoni umngcipheko wengozi kwinyukliya?*

   Uninzi lwee-NPP ezisebenzayo namhlanje zakhiwa ngeminyaka yamashumi asixhenxe namashumi anesibhozo. Iingozi ze-NPP kwi-Three Mile Island, Chernobyl, nase-Fukushima zakhokelela kwimibuzo enzima malunga nokhuselo lwenyukliya kunye nemizi-mveliso zamandla enyukliya zexa elizayo. Isishwankathelo sinikiwe sendlela yokhuseleko lwenyukliya esebenzayo kwiingozi kunye kunye neendlela ezisetyenziswayo zohlolo lokhuseleko. Iimpawu zokhuseleko zezixhobo zombane ze-GEN III kunye nenjongo engundoqo yokuphelisa ngokubonakalayo ukukhutshwa okukhulu kwe-radioactivity kwimeko

yengozi emandundu ebandakanya umonakalo wepetroli yesixhobo sombane kuxoxiwe ngazo. Kugqitywe ekubeni uyilo lwe-GEN III NPP kufuneka luhlangabezane nendlela esetyenziswayo yolawulo lwengozi. Uhlolo loyilo oluthile lwe-NPP ekhethiweyo kwisiza kufuneka lunike imeko yokhuseleko lokugqibela lwenyukliya phambi kokuba umsebenzi we-NPP uvunyelwe ngumLawuli weNyukliya weSizwe.

3) *Zeziphi iingozi zotshiso ngemitha kwizityalo kunye nezilwanyana ezingebabo abantu?*

Ukhuselo kutshiso ngemitha kwentlobo zezityalo nezilwanyana ezingebabo abantu ziye zanda ngokubonakalayo kwiminyaka yakutsha nje. Apho utshiso ngemitha lusetyenzisiweyo ukujoilisa kukhuselo lwabantu ngokusekelwe kwingcinga yokuba, ukuba abantu bakhuselwe, ezo ntlbo zingebabo abantu ezihlala kwimi engqongileyo efanayo ziya kukhuseleka ngokwaneleyo, ukuthathelwa ingqalelo okucacileyo koKhuselo loTshiso ngeMitha kokusiNgqongileyo ngoku kwenziwa isincomo sakho yiKomishoni yamaZwe ngamaZwe kuKhuselo loTshiso ngeMitha (International Commission on Radiological Protection) (ICRP). Uhlolo lohluzo lwenziwa lwamazinga ethamo lotshiso ngemitha kwiseti yezilwanyana kunye nezityala zolingo oluvela kwizinto eziphuma kwi-radioactive ngexa lemisebenzi yesiqhelo ye-NPP. Amazinga ethamo angaphantsi kunexabiso lolingo le-10 microgray per hour (µGy/h), ixabiso elisezantsi kakhulu kunalo naliphi na izinga lethamo apho iziphumo ezinokulinganiswa kwizinto eziphilayo belinokubonwa.

Uphando olungaphaya lusaqhutywa ukumisela iziphumo zeengozi zenyukliya kwizilwanyana kunye nezityalo ezingengabo abantu. IKomiti yezeNzululwazi yeZizwe eziManyeneyo kwiziPhumo zoTshiso ngeMitha ze-Atom (United Nation Scientific Committee on the Effects of Atomic Radiation) (UNSCEAR) yakhupha ingxelo egunyazisiweyo ye-Fukushima apho ukuba sesichengeni kutshiso ngemitha kwizityalo kunye nezilwanyana ezingebabo abantu kwaye kwaqikelelwa. I-UNSCEAR yagqiba ekubeni ukuba nokuba khona kweziphumo kwizityalo kunye nezilwanyana ezingebabo abantu kwimo engqongileyo yasemhlabeni kunye nasemanzini (amanzi afreshi kunye nawaselwandle) bekunyiniwe ngokwejografi kunye nokuba, kwimimandla engaphandle kommandla onyiniweyo, ukuba nobukho beziphumo kwizilwanyana nezityalo kunokuthathwa njengokungabalulekanga.

4) Ngawaphi amanqanaba angoku otshiso ngemitha oluguqulelwa kwimoletyhule ne-radioactivity kwimo engqongileyo yeziza?

Amaphando otshiso ngemitha aqhutywa kwithuba elimalunga nonyaka omnye kuso ngasinye isiza. Iziphumo zikhombisa ukuba ithamo lotshiso ngemitha kubantu abahlala kwimimandla eselunxwemeni ngakwiziza ezithathu lisezantsi kunethamo eliphakathi lehlabathi lamalunga ne-2,4 mSv ngonyaka. Enye yeenjongo zophando yayikukuchonga nakuphi na ukungaqheleki kwe-radioactivity okunokuba khona kwimimandla apho zizinze khona iiziza.

I-radioactivity esemhlabeni ephezulu yobukho bendalo yaye yabonwa kwindawo esentshona yesiza sase-Thyspunt. Iziphumo ze-radioactivity zezilwanyana kunye nezityalo zaselwandle zaqinisekisa okufunyanisiweyo kwamazwe ngamazwe okwenzeka ngendalo kwi-adionuclide polonium-210 kunye negalelo layo lethamo layo eliphezulu ebantwini xa kuthelekiswa nezinye ii-radionuclides. Ii-radionuclides

ezenziweyo, umzekelo i-Cs 137, ziboniwe kuzo zozithathu iziza. Jikelele, ubukho be-Cs 137 bubalelwa kwizehlo zembali ezifana neemvavanyo zezixhobo zeyunithi yomchiza we-atmosfere.

Iziphumo zohlolo olulindelweyo lwe-radiological kwiziza ezithathu oluthiwe thaca kule ngxelo luqinisekisa iimpembelelo zokusingqongileyo ezibaluleke ngokusezantsi kunye neziphumo zokwanda ezisezantsi.

1.32 Ngokungathethekiyo Uyilo Ingozi Yophando

UmZantsi Afrika ucinga ngokwakha iplanti yamandla enyukliya (nuclear power plant [NPP]) edibanisa kuyo iiyunithi zentsabelo (reactor) enamandla ombane aya kutsho kwi-4 000 MWe kunye nezakhiwo zayo. I-EIA inelungiselelo lokuba kwandiswe Inpp ukuvumela ukuba kubekho Umthamo wamandla omalunga ne-10 000 MWe esizeni eso. Kulindeleke ukuba i- light water reactors (LWR) kunye ne-GEN III ethe ngqo ye-pressured water reactors (PWR) iya kukhethwa ngethekhnoloji ekhethiweyo.

Iingozi kwi-NPP bezisoloko zixhomis' amehlo ebantwini ngokubanzi. Le ngxelo isikrobisa kweminye yemiba yokhuseleko ebalulekileyo yeNPP ejoliswe kwezo zinto zikhathaza abantu kwimeko yokuyilwa kwe-GEN III NPP. Uhlolisiso lobuchwephesha obusebenza kwii-NPPs lujolise ekuqinisekiseni abantu ukuba imigaqo yokhuseleko ekhuthazwa yi-International Atomic Energy Agency (IAEA) yaza yamkelwa yiSouth African National Nuclear Regulator iya kuthi ngokwenene incothule neengcambu izinto ezibandela iingozi (beyond design basis accidents [BDBAs]), iingozi ezinamathuba okukhupha amandla erediyo amaninzi kakhulu aye kwindalo esingqongileyo.

Uyilo lwe-Gen III NPP luquka iimpawu ezihluke mpela zokhuseleko xa kuthethwa ngeziganeko ezilandelelanayo ezinokuphumela kwiimeko ezingaphaya kweziyilo ze-NPP, ezaziwa ngokuba ziimeko zokunatyiswa Iziphumo zokuphonononga ukhuseleko zibonisa ukuba iingozi ezingenakuthanani nokuceba ezisenokuba yingozi kuwonke wonke nakwindalo esingqongile zicinywe igama ngenxa yelungiselelo lokunabisa iimeko. Imizekelo yezi zinto zokhuseleko zezi **Error! Reference source not found.**:

. uyilo olulula olwenza ukuba kube lula ukusebenzisa ezi zisabeli kwaye zinyamezeleke ngakumbi kwiimeko zokusebenzi ezingaqhelekanga;

Iinkalo zokhuseleko eziqhubekayo xa kuyilwa isakhiwo ngokwaso; iinkqubo neekhomponenti (systems and components (SCCs) ezikuphephayo ukusebenzisa ukulawula izinto ngezandla nokuxhomekeka kwizinto zemveli ezifana nokuhambisa ngokwemveli izipholisi umz. Ukupholisa isakhiwo esinent ukuze kuphetshwe uxinezelelo olukhulu;

Ukunciphisa ukusilela kwee-SCCs nokuhla komonakalo osemazantsi wamandla amaze xa uthelekiswa nesizukulwana sangaphambili sezisabeli (umzila wobungakanani bokuncipha);

Iinkalo ezintsha zokuyila ezinika intethelelo xa kungenzeka ukuba isisabeli esingundoqo sinyibilike ukuze kuncitshiswe ukukhuthwa kwamandla erediyo kwindalo esingqongileyo; kunye

Nokuxhathisa okuphuculweyo kwiingozi ezivela ngaphandle ezifana nokuphahlazeka kweenqwelo-moya nakwiziganeko ezinzulu zemveli

Ukuthetheleleka kweziphumo zangaphandle kwesiza kwimeko yee-GEN III NPPs zimele kuphela zifuneke kwiimeko ezimaxongo ngokwenene aze ke angabikho amathuba eengozi kuze kubekho iziphumo ezincinane kakhulu kwisithuba nexes, oko kukuthi izinto ezimbalwa ezenziwa kangengexeshana ziya kusebenzia kwindawana encinane kufutshane ne-NPP.

Bekukho iingozi ezinthathu ezinkulu zesisabeli se-BDBA kwimbali yamandla enyukliya asekuhlaleni. Nganye kwezi ngozi yaba nefuthe alahlukileyo kuwonke wonke nakwindalo esingqongileyo:

E-Three Mile Island (USA 1979) – Isisabeli seunithi 2 sasonakele kakhulu kodwa uphehlo lwaluhleli ngaphakathi kwaye zange kubekho ngozi kwimpilo yabantu okanye into eyenzekayo kwindalo esingqongileyo.

E-Chernobyl (Ukraine 1986) – ukutshatyalaliswa kweunithi yesisabeli ebangelwa kukugqabhuka komphunga nomlilo, ingozi eyabulala abantu abayi-31 kwinqanaba lokuqala lengozi yaza yaneziphumo ezibonakalayo kwimpilo yabantu nakwindalo esingqongileyo. Ukufa kwabantu kwanda ukususela ngoko.

E-Fukushima (Japan 2011) apho izisabeli ezindala ezibilisa amanzi zonakala ngokunzulu zaza zikunye nezinye ezine, zavalwayo. Ukuphelelwa sisipholisi kwezisabeli ngenxa yenyiki kwadala itsunami eyaphumela ekusileleni kwazo ukugcina ukuphehlwa okwakhululwa zezo zisabeli zonakeleyo.

Ezimbini kwezoNPP BDBAs ezathi zachongwa njengeengozi ezizezona zinzulu eziquka isisabeli esathi sanyibilika, yasisigcini samanzi esiquka ukugcina isisabeli, umqobo wokugqibela olwa nokukhululwa kwamandla erediyo aye kwindalo esingqongileyo ebudeni be BDBA. I-NPP eFukushima Daiichi eJapan yayizizisabeli zamanzi abilayo awayedibene nezona ziganeko ezinzulu ezivela ngaphandle ngo-11 Matshi 2011.

Izisabeli ezigcina izinto zamelana nemingeni evela ngpahandle kodwa azakwazi kugqabhuko dubulo lwakamva. Eso sisabeli samanzi sakwiThree Mile Island iyunithi yesibini eUnited States saba nefuthe elilinganiselwe kwindalo esingqongileyo nakubantu xa kwenzeka i-BDBA. Yakuphepha ukugqabhuka kwangaphakathi okwakuya kuba ngumngeni kwingqibelelo yokugcina isisabeli. Ishishini lenyukliya laqonda ukubaluleka kokuyila into eza kuba namandla okugcina. Ibiyeyona ndlela inkulu yokunabisa izinto ekuyileni i-Generation III/III+ reactors.

Ukuthelekisa izinto ezingalindeleka kwi- GEN III PWR (ichazwe njengento yaminyaka le) yokukhutshwa kwamandla amakhulu erediyo ebudeni be – BDBA, nto leyo ebinokuphumlea kugqabhuko dubulo lwamandla erediyo kuwonke wonke nomngcipheko wokufa kwabantu, obonisa ukuba umda wokulinganiselwa kwezinto kwi-National Neclear Regulator (NNR) iya kufikelelwa. Amandla akhutshwa kwisiCangca E-1 angathelekiswa nencopho yeNNR yokufa komntu omnye okuyi -5E-06 ngonyaka.

IsiCanga E-1: Umonzakalo ongundoqo kunye nokukhululwa okukhulu kwesuntswana lamandla e- GEN III NPPs

GEN III **Isisabelo Esiyilelwe iPWR**	**Uhlobo Lwamanzi Alula Esisabeli**	**Amandla Omonakalo Ongundoqo (iziganeko ngonyaka ngamnye)**[7]	**Ukukhululwa Okukhulu Kwamandla Erediyo (iziganeko zonyaka ngamnye wesisabeli)**
AES-92	PWR	6.10E-07	1.80E-08
AP1000	Pressurised Water Reactor (PWR)	5.10E-07	3.90E-08
APR-1400	PWR	2.70E-06	8.20E-08
APWR	PWR	4.60E-06	8.10E-07
EPR	PWR	6.10E-07	3.90E-08

I-NPP entsha eza kwakhiwa emZantsi Afrika kuza kufuneka ifake ingxelo yophononongo lokhuseleko ebonelela ngobungqina bamalungiselelo alungiselelweyo. Obu bungiqna kuya kufuneka busekelwe kuhlolisiso lwangaphandle nolwangaphakathi oluqalisa iziganeko ngenjongo yokuphonona iingozi, ezijongene ngqo noyilo lweNPP kule ndawo kuza kwakhiwa kuyo.

[7]The US NRC requirement for calculated core damage frequency is 1E-04, most current US plants have about 5E-05 and Generation III plants are about ten times better than this. The IAEA safety target for future plants is 1E-05.

Iinkalo zokhuseleko lweGEN III NPPs zihambele phambili kakhulu xa zithelekiswa neziyilo ze-NPP eziye zachaphazeleka yi-BDBA kwixa elidluleyo. Kodwa ke, izifundo esizifunde kwingozi yeFukushima Daiichi ziya kuhlala zibalulekile kwishishin lamandla enyukliya. Kwingxelo esandul' ukupapashwe ngale ngozi umlawuli jikelele we IAEA ubethelele ukuba inkcubeko emele ibethelelwe kwishishini lenyukliya yile:

"Akumele kubekho zizathu zokuyekelel' umxakatho ngokuphathelele ukhuseleko lwenyukliya nakweliphi na ilizwe. Ezinye iinkalo eziye zafak' isandla kwingaozi yaseFukushima Daiichi zaziphelele phaya eJapan. Imibuzo eqhubekayo nokukhululeka ukufunda kubalulekile kwinkcubeko yokhuseleko kwaye zibaluleke ngokwenene kumntu wonke okumandla enyukliya. Ukhuseleko lumele lusoloko lusiza kuqala."

1.33 UHlolo loYilo lweDolophu (Appendix E34)

I-GIBB Urban and Rural Planning yaye yaqeshwa yi-Eskom Holdings (SOC) Limited (ESKOM) ukuba iphande ngeempembelelo ezinokuba khona kwisikhululo samandla seNyukliya-1 esicetywayo kwimiba enxulumene noyilo lwedolophu kuso ngasinye sezi ziza zithathu zizezinye (Duynefontein, Bantamsklip ne-Thyspunt) ukusabela kwizimvo ezifunyenwe kwiSebe leMicimbi yokusiNgqongileyo (Department of Environmental Affairs) (DEA) ezifunyenwe ngowama-25 Janywari 2013. Izimvo ziqinisekise imfuno yophononongo lwengcali yoyilo lwedolophu ukuba iqalise ukudibana noMasipala weNgqingqi wase-Kouga, uMasipala weNgingqi wase-Overberg kunye nooMasipala abaMbhaxa baseKapa kunye nokuqulunqa ingxelo yengcali yoyilo lwedolophu. Injongo yengxelo ikukuhlola iziphumo zangaphandle ezingabonwanga ngaphambili ezinxulunyaniswa naluphi na unyino olunokuba khona olunqgalileyo okanye olungangqalanga ekusetyenzisweni komhlaba.

Le ngxelo yohlulwe ngamacandelo amabini. Icandelo lokuqala lengxelo kukubhalwa kolwazi oluqokelelwe kuphando olwenziwe kumaxwebhu ase-ofisini kunye neentlanganiso noomasipala ababandakanyekayo. Icandelo lokuqala ke ngoko lixoxa ngoku kulandelayo:

1. Ukuqinisekiswa kweendawo ezikuyo iziza, inkcazo yeepropati kunye nalo lonke ulwazi olubandakanyekayo lweepropati ezimnini wazo iyi-ESKOM;
2. Inkcazo yeziza ezicetywayo kunye neendawo ezizijikelezileyo ngokwendawo ezikuyo buqu; kunye
3. Nokunxulumanisa isiza kunye nophuhliso olucetywayo kumgaqo-nkqubo obandakanyekayo okhokela uphuhliso lwexa elizayo kummandla olunokuba neempembelelo kwiziza ezicetywayo.

Icandelo lesibini lengxelo linohlolo lwesiza. Ulwazi olufunyenwe kuphando lwemithombo yamaxwebhu ase-ofisini kunye namadliwano-ndlebe lwahlalutywa ukumisela iimpembelelo zophuhliso olucetywayo kuyilo lwexa elizayo lomamndla ezimi kuwo iziza.

Uhlalutyo lwesiza luquka uhlalutyo lwe-SWOT kunye nemo engqongileyo ejikelezileyo kuhlolo lwesiza.

Injongo yohlalutyo lwe-SWOT kukuchonga amandla, ubuthathaka, amathuba kunye neentsongelo zesiza ngasinye. Olu hlalutyo lunika inkombiso yemiba ebalulekileyo ekuza kufuneka ukuba ilungiswe ngokunjalo nokuchonga okuhle kwisiza ngasinye eso isibonelelo seNyukliya 1 siza kuma khona kuyo kuso nasiphi na kwiziza ezithathu. Okufunyanisiweyo okungundoqo kuhlalutyo lwe-SWOT kubekwe kwiTheyibhile ysi-2: Iimpembelelo zokuSetyenziswa koMhlaba ngezantsi.**ITheyibhile yesi-2: IiMpembelelo zokuSetyenziswa koMhlaba2**

Indlela ethathiweyo emo engqongileyo ejikelezileyo kuhlolo lwesiza ibikukuhlola kunye nokulinganisa iziza ngokusebenzisa indlela yophuhliso ukuze kumiselwe indlela yesiza esikhethwayo.

Indlela yokuphuhlisa isebenza njengesixhobo esiqaqambisa okuhle kunye nokubi ekubekweni kwesibonelelo seNyukliya -1 esicetywayo kwisiza esithile. Indlela yophuhliso inokufakwa kwiqela lamacandelo amane ophuhliso, angala:

- Imo engqongileyo yeziko;
- Imo engqongileyo yoqoqosho;
- Imo engqongileyo yezentlalo; kunye
- Nemo engqongileyo yobuqu (equka iimpawu zendalo kunye neempawu ezenziwe ngumntu).

Amacandelo amane akhonjiswe ngasentla enza undoqo wophuhliso lwedolophu njengoko kubonisiwe kwiTheyibhile yoku-1: Ukuhlolwa kwesiza ngokwendlela esetyenziswayo engezantsi.**ITheyibhile yoku-1: Ukuhlolwa kwesiza ngokwendlela esetyenziswayo1**

ITheyibhile yoku-1: Ukuhlolwa kwesiza ngokwendlela esetyenziswayo1

Indlela esetyenziswayo yokuhlola	Ukunika amanqaku		
Okweziko			
Ubukho besakhiwo seziko	**I-10 leekhilomitha (5)**	**Ama-20 eekhilomitha (3)**	**Ama-30 eekhilomitha (1)**
I-Duynefontein	5		
I-Bantamsklip		3	
I-Thyspunt		3	
Ezoqoqosho			
Ukuba kufuphi kwabasebenzi abasele bekhona	**I-10 leekhilomitha (5)**	**Ama-20 eekhilomitha (3)**	**Ama-30 eekhilomitha (1)**
I-Duynefontein		3	
I-Bantamsklip		3	
I-Thyspunt	5		
Ezentlalo			
Ukuba kufuphi kwabahlali	**Isi-5 seekhilomitha (0)**	**I-10 leekhilomitha (3)**	**Ama-20 eekhilomitha (5)**
I-Duynefontein		3	
I-Bantamsklip			5
I-Thyspunt		3	
Umgama kwiinkonzo zedolophu	**I-10 leekhilomitha**	**Ama-20 eekhilomitha (3)**	**Ama-30 eekhilomitha**

	(5)		**(1)**
I-Duynefontein	5		
I-Bantamsklip		3	
I-Thyspunt	5		
Okubonakalayo			
Ubukho beenkonzo ezininzi	**I-10 leekhilomitha (5)**	**Ama-20 eekhilomitha (3)**	**Ama-30 eekhilomitha (1)**
I-Duynefontein	5		
I-Bantamsklip		3	
I-Thyspunt	5		
Kwindlela yokukhula okulindelekileyo kommandla	**EWE (0)**	**HAYI (5)**	
I-Duynefontein	0		
I-Bantamsklip		5	
I-Thyspunt		5	
Ukusetyenziswa komhlaba ojikelezileyo ofanelekileyo	**Ofanelekileyo (5)**	**Ongafanelekanga (0)**	
I-Duynefontein	5		
I-Bantamsklip	5		
I-Thyspunt	5		
Ukungena ngendlela esemgangathweni	**Isi-5 seekhilomitha (5)**	**I-10 leekhilomitha (3)**	**Ama-20 eekhilomitha (0)**
I-Duynefontein	5		
I-Bantamklip	5		
I-Thuyspunt	5		
Ubunzima bokululungiswa kweendlela zothutho	**Akunzimanga (5)**	**Kuphakathi (3)**	**KuNzima Kakhulu (0)**
I-Duynefontein	5		
I-Bantamklip			0
I-Thyspunt		3	
Ukuba nobukho bokungena okongeziweyo	**EWE (5)**	**HAYI (0)**	
I-Duynefontein	5		
I-Bantamsklip		0	
I-Thyspunt	5		
Ukuba nobukho bokuhlanganiswa okugudileyo besibonelelo (iimpembelelo zokubona/ingxolo/ivumba)	**EWE (5)**	**HAYI (0)**	
I-Duynefontein	5		
I-Bantamsklip	5		
I-Thyspunt	5		
Kuphelele			
I-Duynefontein			46
I-Bantamsklip			37
I-Thyspunt			49

Itheyibhile engentla yendlela esetyenziswayo ikhombisa i-Thyspunt njengesona siza sinamanqaku aphezulu, ke ngoko ibe sisiza esikhethwayo ngokombono woyilo lwasezidolophini kwisibonelelo esicetywayo seNyukliya-1.

Itheyibhile engezantsi ishwankathela iimpembelelo zokusetyenziswa komhlaba zesibonelelo esicetywayo seNyukliya-1 esinokuma kwesinye seziza ezithathu. Ezi mpembelelo zokusetyenziswa komhlaba ziquka:

- iimpembelelo ngqo ekusetyenzisweni komhlaba;
- iimpembelelo ezingangqalanga ekusetyenzisweni komhlaba;
- ukufaneleka nezixhobo zoyilo zengingqi njengemigaqo-nkqubo; kunye
- neempembelelo zesibonelelo kwimeko yengxakeko.

ITheyibhile yesi-2: IiMpembelelo zokuSetyenziswa koMhlaba2

	I-Duynefontein	I-Bantamsklip	I-Thyspunt
Iimpembelelo ngqo ekusetyenzisweni komhlaba UMzekelo, iimpembelelo zesiza seNyukliya ngokunjalo neemimandla yokucwangcisela ingxakeko ekwandisweni kwedolophu.	• Uphuhliso olucetywayo lunokuba neempembelelo kuphuhliso lwexa elizayo lommandla i.t.o. umhlaba onokusetyenziselwa uphuhliso lwexa elizayo. Imimandla ejikeleze isiza kuza kufuneka ukuba ikhuselwe, iingxinano kunokufuneka ukuba zibe sezantsi kunaxa belungekho apho uphuhliso kwaye ukuphuculwa kwezakhiwo kuza kufuneka, ingakumbi iindlela.	• Isiza esicetywayo asikho kwindlela yokukhulisa uphuhliso lwexa elizayo lwedolophu. • Iimpembelelo zokwandiswa kwedolophu ziya kunyinwa ngexa yokufana neelali kweedolophu. Ukukhula kweedolophu ngenxa yesibonelelo seNyukliya 1 esakhiwa kwisiza esindululwayo sase-Bantamsklip kuza kufuneka kulawulwe kwaye kusiwe kwimimandla leyo uphuhliso kunye nokwanda kunokufaneleka khona.	• Isiza esicetywayo asikho kwindlela yokukhulisa uphuhliso lwexa elizayo lwedolophu. • Ukukhula kunye nophuhliso lweedolophu ezikufutshane kuza kufundka ukuba kulawulwe ukuthobela unyino kunye nemimiselo ephathelene nesibonelelo senyukliya kummandla ongqongileyo.
Iimpembeleo ezingangqalanga ekusetyenzisweni komhlaba	• Ukuthontelana kwabantu abamalunga nama-2 000, njengoko kuthelekelelwa xa isiza sesisebenza ngokupheleleyo, ngeke kubenazo iimpembelelo ezinkulu kwiinkonzo nakwizibonelelo (ukusetyenziswa komhlaba ngokungangqalanga) ezifunekayo ukubagcina njengoko kunjalo kwiziza sase-Bantamsklip nase-Thyspunt. Oku kuthathela ingqalelo kuphela ukonyuka	• Ukuthontelana kwabantu abamalunga nama-2 000, njengoko kuthelekelelwa xa isiza sesisebenza ngokupheleleyo, kuya kuba neempembelelo ezinkulu kwiinkonzo nakwizibonelelo ezifunekayo zokubagcina. Ingakumbi kummandla ofana ne-Gansbaai ne-Pearly Beach onabantu abasele bekhona abamalunga nama-11 000 kunye ne-1 500	• Ukuthontelana kwabantu abamalunga nama-2 000, njengoko kuthelekelelwa xa isiza sesisebenza ngokupheleleyo, kuya kuba neempembelelo ezinkulu kwiinkonzo nakwizibonelelo ezifunekayo zokubagcina kwimimandla efana noo-Humansdorp.

	kwabantu hayi iimpembelelo kwimigaqo-nkqubo esele ikhona ngenxa yeSikhululo samandla sase-Koeberg.	ngokulandelelana.	
Ukungqinelana nezixhobo zoyilo zengingqi nemigaqo-nkqubo	• Isibonelelo seNyukliya 1 asikhankanywanga ngokukodwa kwi-SDF kaMasipala, kodwa ukusetyenziswa komhlaba ojikelezileyo okhoyo kuyangqinelana nokusetyenziswa komhlaba okucetywayo. • Kukho imbambano ethile nokusetyenziswa komhlaba kwexa elizayo kuba isiza simi kwindlela ekhulayo yesixeko. Ukuba ngaba uphuhliso olucetywayo luyaphunyezwa, oku kunokuba neempembelelo kuphuhliso lwexa elizayo lwesixeko i.t.o. Uhlobo lwedolophu (iingxinano ezivumelekileyo, njalo njalo) kunye nemodeli ekhoyo yolawulo lwengozi/ukukhutshwa kwabantu. • Kukho iinkqubo zomthetho ezisebenzayo eziza kuvumela ukungeniswa kwesicelo kuMasipala ukuze kufunyanwe amalungelo okusetyenziswa komhlaba okucetyiweyo.	• Isibonelelo seNyukliya 1 asikhankanywanga ngokukodwa kwi-SDF kaMasipala • Ukusetyenziswa komhlaba ojikelezileyo kuyangqinelana neNyukliya 1 ecetywayo. • Isicwangciso sexa elizayo sicebisa ukuba ukusetyenziswa okucetywayo kunokufakwa kwisiza esicetywayo. • Kukho iinkqubo zomthetho ezisebenzayo eziza kuvumela ukungeniswa kwesicelo kuMasipala ukuze kufunyanwe amalungelo okusetyenziswa komhlaba okucetyiweyo.	• Isibonelelo seNyukliya 1 asikhankanywanga ngokufutshane nje kuphela kwi-SDF yase-Kouga. • Ukusetyenziswa komhlaba ojikelezileyo kuyangqinelana neNyukliya 1 ecetywayo. • Isicwangciso sexa elizayo sicebisa ukuba ukusetyenziswa okucetywayo kunokufakwa kwisiza esicetywayo. • Kukho iinkqubo zomthetho ezisebenzayo eziza kuvumela ukungeniswa kwesicelo kuMasipala ukuze kufunyanwe amalungelo okusetyenziswa komhlaba okucetyiweyo.
Iimpembelelo kwimeko yengxakeko	• Kukho uphuhliso osele lukhona lwedolophu olukwisiza esicetyiswayo ekuza kuba khona iimpembelelo kulo, ingakumbi kumazantsi	• Uphuhliso olunomda lukhona ngakwisiza kwaye iimpembelelo ziya kuba sezantsi kunezase-Duynefontein ngexa yesimo sokuba ziilali	• Uphuhliso olunomda lukhona ngakwisiza. • Isimo sokuba ziilali kommandla siya kuxhasa iinkqubo zengxakeko ezinxulunyaniswa

	kunye nakwimpuma yesiza. • Isiza simi ngokoyameneyo nomzi-mveliso wamandla enyukliya osele ukhona osebenzayo.	kwesiza sase-Bantamsklip site. • Ixesha eliya kuthathwa ukukhupha abantu ngakwisiza liya kuba lincinane kwimeko ye-Duynefontein. Ayikho ingxinano yabantu ejikeleze isiza. Iidolophu ezikufutshane yi-Buffeljagsbaai, Pearly Beach ne-Gansbaai.	nesibonelelo senyukliya esicetywayo.

1.34 INgxelo yokuHlanganiswa kweeNtambo eziHamba uMbane (Appendix E35)

ISISHWANKATHELO ESIPHELELEYO

Imvelaphi

Iziza ezithathu zaye zachongwa zaze zahlolwa ngenkqubo yesigaba soHlolo lweeMpembelelo zokusiNgqongileyo (Environmental Impact Assessment) (EIA) ukuze kwakhiwe isikhululo samandla enyukliya seprojekthi yeNyukliya-1 kunye nezigaba ezilandelayo njengenxenye yeenyukliya ezininzi, ezizezi, i-Thyspunt, Bantamsklip ne-Duynefontein. Ukuhlangansiwa kwesikhululo samandla enyukliya esiphakathi kwama-3 000 MW nama-5 000 MW kwisiza ngasinye kwinkqubo ezingundoqo sokuhamba komabne okungundoqo sibe yinkqubo kuphandwe ngeSicwangciso seGridi phakathi kuka-2006 no-2009. Kulandela la maphononongo kubekho uphuhliso oluninzi olungundoqo ngokuphathelene nesizukulwana sexa elizayo eMzantsi Afrika ngokunjalo notshintsho kwimfuno yombane elindelweyo elizweni.

Omnye wondoqo wophuhliso yaba kukukhutshwa kweSicwangciso semiThombo eHlanganisiweyo (Integrated Resources Plan) (IRP) sika-2011 kunye kunye nokufakwa kwisikeyile esikhulu kwamandla ombane avuselelwayo nguRhulumente woMzantsi Afrika, kuquka nokwaziswa kweNkqubo yokuFumana iiNkonzo yoMvelisi waMandla oMbane oVuseleleweyo oziMeleyo (Renewable Energy Independent Power Producer Procurement Programme) (REIPPPP) esele igqibe amaThuba okuBhida amathathu enkqubo yeBhidi yaMandla oMbane aVuselelwayo (Bid Windows of the Renewable Energy Bid) (REBID). Oku kukhokelele kusasazo ngokwefjografi olutsha ngokupheleleyo lwamandla ombane, ingakumbi ukuveliswa kombane omninzi okutsha onokuba khona kumaPhondo eKoloni, oko okuya kuba neempembelelo kuhlanganiso lwemizi-mveliso yamandla enyukliya ecetywayo. Umhla ocetywayo wesikhululo samandla ombane seNyukliya waye wabuyiselwa emva waya ku-2023 yi-IRP kwaye izicwangciso zokuhlanganisa ziqwalaselwa kwakhona kumathuba athile kwiziza ezithathu ezikhethiweyo.

Ngo-2014 isicwangciso sexesha elide “UPhononongo loThungelwano lweeNtambo zoMbane luka-2040 lwe-Eskom” lwaye lwagqitywa, ukwakhiwa kweeNdawo zoPhuhliso

lwaMandla oMbane aVuselelwayo (Renewable Energy Development Zones) (REDZ) zachongwa kwaze kwaqaliswa inkqubo ye-IPP yolungiselelo uyamandla ombane aveliswa ngegesi Zonke ezi zineempembelelo kwizicwangciso zokuhlanganisa ukuhanjiswa kombane wenyukliya.

Olu qwalaselo kwakhona luka-2015 lunika uhlolo lwenqanaba eliphezulu elihlaziyiweyo lweempembelelo zolu tshintsho ekuhlangansiweni kokuhanjiswa kombane wokhetho kwiziza ezithathu zeprojekthi yeNyukliya -1. Amaphononongo okugqibela acazululiweyo okuhamba kombane aya kuqaliswa kuphela xa sele kukho isibophelelo esiqinisekileyo somhla ekujoliswe kuwo sesikhululo samandla seNyukliya-1.