

1.1 MONITORING PLAN
Construction period

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge																																																																																																			
Air quality	H ₂ S - CO ₂	Borinquen Hotel and 4 sites (north, south, east and west) on the well base boundary	During testing period (weeks-one month): every three month (quarterly) and permanent monitoring station	Field measurement	ICE																																																																																																			
Air Quality Monitoring - CAMPO GEOTERMICO BORINQUEN																																																																																																								
<table border="1"> <thead> <tr> <th>Site</th> <th>CO2 Min</th> <th>CO2 Avg</th> <th>CO2 Max</th> <th>CO2 Std</th> <th>H2S Min</th> <th>H2S Avg</th> <th>H2S Max</th> <th>H2S Std</th> </tr> </thead> <tbody> <tr> <td>CAÑAS DULCES</td> <td>252</td> <td>282</td> <td>310</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.002</td> <td>0.010</td> </tr> <tr> <td>CASA MAQUINAS BORINQUEN</td> <td>232</td> <td>272</td> <td>300</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.002</td> <td>0.010</td> </tr> <tr> <td>HOTEL BORINQUEN</td> <td>239</td> <td>271</td> <td>303</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.001</td> <td>0.010</td> </tr> <tr> <td>HOTEL BUENA VISTA</td> <td>244</td> <td>269</td> <td>293</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.002</td> <td>0.010</td> </tr> <tr> <td>PGB-42</td> <td>274</td> <td>286</td> <td>302</td> <td>5,000</td> <td>0.000</td> <td>0.005</td> <td>0.024</td> <td>0.010</td> </tr> <tr> <td>PLB-02</td> <td>235</td> <td>276</td> <td>330</td> <td>5,000</td> <td>0.000</td> <td>0.002</td> <td>0.005</td> <td>0.010</td> </tr> <tr> <td>PLB-03</td> <td>235</td> <td>272</td> <td>304</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.003</td> <td>0.010</td> </tr> <tr> <td>PLB-05</td> <td>235</td> <td>279</td> <td>313</td> <td>5,000</td> <td>0.000</td> <td>0.001</td> <td>0.010</td> <td>0.010</td> </tr> <tr> <td>PLB-09</td> <td>237</td> <td>271</td> <td>308</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.001</td> <td>0.010</td> </tr> <tr> <td>POBLADO BUENA VISTA</td> <td>234</td> <td>270</td> <td>290</td> <td>5,000</td> <td>0.000</td> <td>0.000</td> <td>0.001</td> <td>0.010</td> </tr> </tbody> </table>						Site	CO2 Min	CO2 Avg	CO2 Max	CO2 Std	H2S Min	H2S Avg	H2S Max	H2S Std	CAÑAS DULCES	252	282	310	5,000	0.000	0.000	0.002	0.010	CASA MAQUINAS BORINQUEN	232	272	300	5,000	0.000	0.000	0.002	0.010	HOTEL BORINQUEN	239	271	303	5,000	0.000	0.000	0.001	0.010	HOTEL BUENA VISTA	244	269	293	5,000	0.000	0.000	0.002	0.010	PGB-42	274	286	302	5,000	0.000	0.005	0.024	0.010	PLB-02	235	276	330	5,000	0.000	0.002	0.005	0.010	PLB-03	235	272	304	5,000	0.000	0.000	0.003	0.010	PLB-05	235	279	313	5,000	0.000	0.001	0.010	0.010	PLB-09	237	271	308	5,000	0.000	0.000	0.001	0.010	POBLADO BUENA VISTA	234	270	290	5,000	0.000	0.000	0.001	0.010
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Noise	Noise level	Borinquen Hotel, one site on the well base boundary (in the hotel direction), and 4 sites (north, south, east and west) in the vicinity of the power plant site.	During testing period (weeks-one month): once/week During power plant construction: monthly (with peak time for each construction job taken into account)	Field measurement	ICE																																																																																																			

Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
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Noise - CAMPO GEOTERMICO BORINQUEN				
Site	Noise Min	Noise Avg	Noise Max	Noise Std
CAÑAS DULCES	36	40	43	65
CASA MAQUINAS BORINQUEN	33	40	68	65
HOTEL BORINQUEN	33	36	48	65
HOTEL BUENA VISTA	33	35	38	65
PGB-42	48	65	77	65
PLB-02	34	58	80	65
PLB-03	33	38	64	65
PLB-05	35	58	88	65
PLB-09	33	38	57	65
POBLADO BUENA VISTA	33	34	38	65

Water quality	1) pH, Electric conductivity (EC), Chlorides (Cl-)	Upper and lower streams of the Salitral rivers, upper and lower streams within the project area (AP) of the creek running.	1) During testing period: twice/testing period (weeks-one month)	Laboratory analysis of collected samples	ICE and External laboratory to hire by ICE
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Attachment 2

Geothermal Field	CG-BRQ
Monitored variable	pH Lab.

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	7.86	5.99	6.9
CG-BRQ --- NACIENTE NAVARIT	7.83	5.71	6.8
CG-BRQ --- QUEBRADA GATA	8.12	5.36	7.3
CG-BRQ --- QUEBRADA TENCHA (PBR11)	7.81	5.76	6.9
CG-BRQ --- RIO SALITRAL	8.34	6.04	7.5
CG-BRQ --- RIO TIZATE	8.39	6.72	7.8
CG-BRQ --- TERMAL LOS PEDERNALES	7.28	5.95	6.7
CG-BRQ --- TOMA AGUA LAS LILAS	7.01	5.9	6.7
CG-BRQ --- TOMA DE AGUA PLB-02	7.97	4.66	7.3
CG-BRQ --- TOMA DE AGUA PLB-05	7.61	5.8	7.1
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	7.84	7.08	7.387142857
Total general	8.39	4.66	7.3

Geothermal Field	CG-BRQ
Monitored variable	Cond. ($\mu\text{S}/\text{cm}$)

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	210.9	97	155.6
CG-BRQ --- NACIENTE NAVARIT	245.4	148.9	184.0
CG-BRQ --- QUEBRADA GATA	348	115.4	217.6
CG-BRQ --- QUEBRADA TENCHA (PBR11)	263	74.5	142.4
CG-BRQ --- RIO SALITRAL	328	80.8	170.4
CG-BRQ --- RIO TIZATE	306.5	102.6	220.3
CG-BRQ --- TERMAL LOS PEDERNALES	187	138.7	162.5
CG-BRQ --- TOMA AGUA LAS LILAS	189	141.5	178.1
CG-BRQ --- TOMA DE AGUA PLB-02	432.3	70.6	128.3
CG-BRQ --- TOMA DE AGUA PLB-05	674	78.8	147.6
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	676	102.6	359.5
Total general	676	70.6	174.9

Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
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Geothermal Field	CG-BRQ	
Monitored variable	Cl- (ppm)	

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	8	2.5	4.3
CG-BRQ --- NACIENTE NAVARIT	7.8	2	4.3
CG-BRQ --- QUEBRADA GATA	12.2	1.31	5.9
CG-BRQ --- QUEBRADA TENCHA (PBR11)	11.3	1.43	4.6
CG-BRQ --- RIO SALITRAL	27.94	1.35	6.5
CG-BRQ --- RIO TIZATE	16.1	4.06	9.0
CG-BRQ --- TERMAL LOS PEDERNALES	4.72	2.64	3.2
CG-BRQ --- TOMA AGUA LAS LILAS	11.5	3.79	5.6
CG-BRQ --- TOMA DE AGUA PLB-02	7.49	2.76	4.6
CG-BRQ --- TOMA DE AGUA PLB-05	13.1	2	4.5
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	8.18	0.97	4.7
Total general	27.94	0.97	5.9

Water quality	2) Oils and grease,	Outlet of the settling basin (construction work effluents). Only in the presence of machinery in the project area (AP)	2) Oils and grease, every six months (semester) After 2 years, the continuation of monitoring will be reconsidered based on opinions of professional experts.)	Laboratory analysis of collected samples	ICE and External laboratory to hire by ICE

Site	Oils and grease (mg/L)		
	Standard 50 mg/L	Min	Max
Q. Gata Abajo	<0,2		8
Q. Gata Arriba	<0,2		<1
Río Salitral Abajo	<0,2		4
Río Salitral Arriba	<0,2		<1
Río Tizate Abajo	<0,2		<1
Río Tizate Arriba	<0,2		<1
Tencha Abajo	<0,2		<1
Tencha Arriba	<0,2		<1
Toma PLB-02	<0,2		<1
Toma PLB-05	<0,2		<1

Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge									
Water quality	3) Hexavalent chrome (Cr+6), and Mercury (Hg) and COD	NOT APPLICABLE (NA)	NOT APPLICABLE (NA)	-----										
Water quality	4) Arsenic (As)	Only in drinking water intakes	every six months (semester) After 2 years, the continuation of monitoring will be reconsidered based on opinions of professional experts.)	Laboratory analysis of collected samples	ICE and External laboratory to hire by ICE									
<table border="1"> <thead> <tr> <th>Site</th> <th colspan="2">Arsenic (mg/L)</th> </tr> <tr> <th>Standard 0,01 mg/L</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Plantel Curubandé</td> <td><1</td> <td><2</td> </tr> </tbody> </table>						Site	Arsenic (mg/L)		Standard 0,01 mg/L	Min	Max	Plantel Curubandé	<1	<2
Site	Arsenic (mg/L)													
Standard 0,01 mg/L	Min	Max												
Plantel Curubandé	<1	<2												
Soil	Complete analysis - Cadmium (Cd), Lead (Pb), As, Cr ⁺⁶ , Hg, etc.	Four points in the vicinity of a representative geothermal field	One year before construction starts, and once five years after operation starts	Laboratory analysis of collected samples	ICE									
		Four points in the vicinity of the power plant site	One year before construction starts, and once five years after operation starts											
Not applicable for this period. Monitoring in 2022.														

Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
Fauna and flora	Plants and animals (birds, amphibians, reptiles, and mammals)	Area in the vicinity of wells and power plant site, the project site side of the national park, and gallery forest along the Salitral river	Monthly (with rainy and dry seasons, breeding seasons, etc. taken into account)	Visual observation records and photographs	ICE

Results of monitoring and state of conservation of species. April, may and june			
2021.			
Group	State of conservation		
Amphibian	CITES	IUCN	MINAE N° 40548- Regulations
<i>Agalychnis callidryas</i>	II		RP
<i>Cochranella granulosa</i>			
<i>Craugastor fitzingeri</i>			
<i>Craugastor mimus</i>			RP
<i>Engystomops pustulosus</i>			RP
<i>Leptodactylus savagei</i>			
<i>Lithobates forreri</i>			
<i>Lithobates warszewitschii</i>			
<i>Pristimantis ridens</i>			
<i>Rhinella horribilis</i>			
<i>Smilisca baudinii</i>			
<i>Smilisca sordida</i>			
<i>Incilius luetkenii</i>			RP
<i>Incilius valliceps</i>			
<i>Leptodactylus poecilochilus</i>			
<i>Trachycephalus typhonius</i>			
<i>Craugastor bransfordii</i>			
Birds			
<i>Amazilia rutila</i>	II		RP
<i>Amazilia saucerrottei</i>	II		RP
<i>Amazona albifrons</i>	II		RP
<i>Arremon aurantirostris</i>			
<i>Arremonops conirostris</i>			
<i>Arremonops rufivirgatus</i>			
<i>Basileuterus rufifrons</i>			
<i>Brotogeris jugularis</i>	II		RP
<i>Burhinus bistriatus</i>	III		
<i>Buteo plagiatus</i>	II		RP
<i>Calocitta formosa</i>			
<i>Campephilus guatemalensis</i>			
<i>Campylorhynchus rufinucha</i>			
<i>Cantorchilus modestus</i>			
<i>Cathartes aura</i>			
<i>Catharus ustulatus</i>			

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<i>Chiroxiphia linearis</i>			
<i>Chlorostilbon canivetii</i>	II		RP
<i>Ciccaba virgata</i>	II		RP
<i>Colinus cristatus</i>			
<i>Coragyps atratus</i>			
<i>Crax rubra</i>	III	VU	RP
<i>Crotophaga sulcirostris</i>			
<i>Crypturellus cinnamomeus</i>			
<i>Dendrocincla homochroa</i>			
<i>Eucometis penicillata</i>			
<i>Eumomota superciliosa</i>			
<i>Euphonia hirundinacea</i>			
<i>Eupsittula canicularis</i>	II		RP
<i>Eurypyga helias</i>			RP
<i>Falco ruficularis</i>	II		RP
<i>Galbula ruficauda</i>			
<i>Geothlypis poliocephala</i>			
<i>Habia fuscicauda</i>			
<i>Habia rubica</i>			
<i>Henicorhina leucosticta</i>			
<i>Herpetotheres cachinnans</i>	II		RP
<i>Hylophylax naevioides</i>			
<i>Lepidocolaptes souleyetii</i>			
<i>Leptotila verreauxi</i>			
<i>Megarynchus pitangua</i>			
<i>Megascops cooperi</i>	II		RP
<i>Melanerpes hoffmannii</i>			
<i>Microcerculus philomela</i>			
<i>Mionectes oleagineus</i>			
<i>Momotus lessonii</i>			
<i>Morococcyx erythropygus</i>			
<i>Myiarchus nuttingi</i>			
<i>Myiarchus tuberculifer</i>			
<i>Myiarchus tyrannulus</i>			
<i>Myiodynastes luteiventris</i>			
<i>Nyctibius jamaicensis</i>			
<i>Nyctidromus albicollis</i>			
<i>Pachysylvia decurtatus</i>			


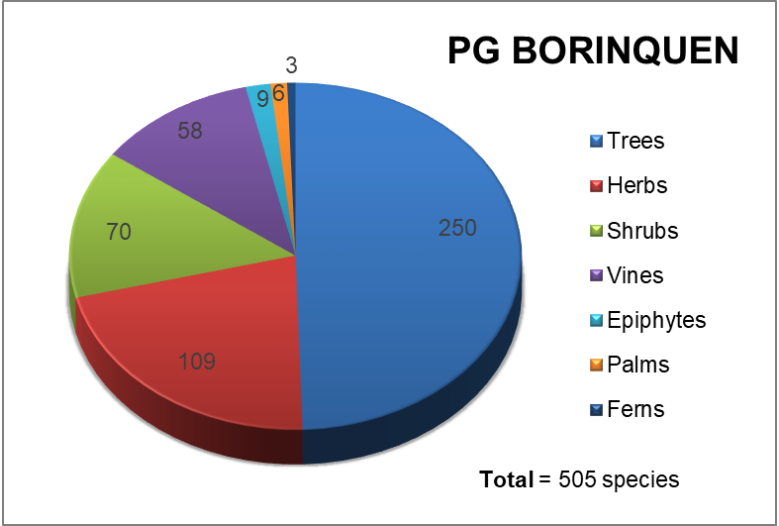
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<i>Passerina caerulea</i>			
<i>Patagioenas flavirostris</i>			
<i>Penelope purpurascens</i>	III		RP
<i>Peucaea ruficauda</i>			
<i>Phaethornis longirostris</i>	II		RP
<i>Phaethornis striigularis</i>	II		RP
<i>Playa cayana</i>			
<i>Pitangus sulphuratus</i>			
<i>Polioptila albiloris</i>			
<i>Polioptila plumbea</i>			
<i>Pseudastur albicollis</i>	II		RP
<i>Psilorhinus morio</i>			
<i>Pteroglossus torquatus</i>			
<i>Ramphastos sulfuratus</i>	II		RP
<i>Ramphocaenus melanurus</i>			
<i>Setophaga petechia</i>			
<i>Streptoprocne zonaris</i>			
<i>Sturnella magna</i>			
<i>Thamnophilus doliatus</i>			
<i>Thryophilus pleurostictus</i>			
<i>Thryophilus rufalbus</i>			
<i>Tinamus major</i>		NT	RP
<i>Tityra semifasciata</i>			
<i>Trogon elegans</i>			
<i>Trogon melanocephalus</i>			
<i>Turdus grayi</i>			
<i>Tyrannus melancholicus</i>			
<i>Volatinia jacarina</i>			
<i>Xiphorhynchus lachrymosus</i>			
<i>Zenaida asiatica</i>			
<i>Rupornis magnirostris</i>	II		RP
<i>Tigrisoma mexicanum</i>			
<i>Notharchus hyperrhynchus</i>			
<i>Vireo olivaceus</i>			
<i>Sporophila funerea</i>			
<i>Ciccaba nigrolineata</i>	II		RP
<i>Hylomanes momotula</i>			RP
<i>Elanoides forficatus</i>	II		RP

<i>Chloroceryle americana</i>			
<i>Ictinia plumbea</i>	II		RP
Mammals (Visual, Sherman, Mist nets and Camera trap)			
<i>Alouatta palliata</i>	I		EN
<i>Artibeus jamaicensis</i>			RP
<i>Artibeus lituratus</i>			
<i>Artibeus tolteca</i>			
<i>Artibeus watsoni</i>			
<i>Ateles geoffroyi</i>	I	EN	EN
<i>Caluromys derbianus</i>			
<i>Carollia castanea</i>			
<i>Carollia perspicillata</i>			
<i>Carollia sowelli</i>			
<i>Carollia subrufa</i>			
<i>Dasyprocta punctata</i>	III		
<i>Glossophaga commissarisi</i>			
<i>Glossophaga soricina</i>			
<i>Heteromys salvini</i>			
<i>Lophostoma brasiliense</i>			
<i>Micronycteris microtis</i>			
<i>Micronycteris schmidtorum</i>			
<i>Myotis albescens</i>			
<i>Nasua narica</i>	III		
<i>Odocoileus virginianus</i>	III		
<i>Otodylomys phyllotis</i>			
<i>Platyrrhinus helleri</i>			
<i>Potos flavus</i>	III		
<i>Proechimys semispinosus</i>			
<i>Pteronotus mesoamericanus</i>			
<i>Rhogeessa bickhami</i>			
<i>Sciurus variegatoides</i>			
<i>Sylvilagus floridanus</i>			
<i>Tapirus bairdii</i>	I	EN	EN
<i>Tylomys watsoni</i>			
<i>Vampyriscus nymphaea</i>			RP
<i>Micronycteris hirsuta</i>			
<i>Artibeus aztecus</i>			
<i>Myotis riparius</i>			

<i>Canis latrans</i>			
<i>Conepatus semistriatus</i>			
<i>Cuniculus paca</i>	III		
<i>Dasypus novemcinctus</i>			
<i>Didelphis marsupialis</i>			
<i>Didelphis virginiana</i>			
<i>Eira barbara</i>			
<i>Leopardus pardalis</i>	I		EN
<i>Panthera onca</i>	I	NT	PE
<i>Pecari tajacu</i>	II		RP
<i>Puma concolor</i>	I		EN
<i>Tamandua mexicana</i>	III		
<i>Tayassu pecari</i>	II	VU	EN
Reptiles			
<i>Bothrops asper</i>			
<i>Coleonyx mitratus</i>			RP
<i>Ctenosaura similis</i>			
<i>Holcosus festivus</i>			
<i>Holcosus undulatus</i>			
<i>Lampropeltis abnorma</i>			
<i>Mastigodryas melanolomus</i>			
<i>Ninia sebae</i>			
<i>Norops biporcatus</i>			
<i>Norops cupreus</i>			
<i>Norops oxylophus</i>			
<i>Porthidium ophryomegas</i>			
<i>Scolecophis atrocinctus</i>			
<i>Sibon nebulatus</i>			
<i>Sphenomorphus cherriei</i>			
<i>Lepidophyma flavimaculatum</i>			
<i>Imantodes cenchoa</i>			
<i>Holcosus quadrilineatus</i>			
<i>Coniophanes piceivittis</i>			
<i>Dipsas bicolor</i>			

I=Appendix I CITES, II=Appendix II CITES, III=Appendix III CITES, IUCN= The International Union for Conservation of Nature, CITES=The Convention on International Trade in Endangered Species of Wild Fauna and Flora, NT= Near Threatened, EN= endangered species, RP= species with reduced or threatened populations, VU= Vulnerable.

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge																		
				<p style="text-align: center;"><u>Wild animals monitoring. June 2020.</u> <u>Daytime monitoring</u></p>  <p style="text-align: center;"><u>Distribution of flora species by habits registered in the Borinquen Geothermal Field. March 2014 – July 2021.</u></p>  <table border="1"> <caption>PG BORINQUEN - Flora Species Distribution</caption> <thead> <tr> <th>Habit</th> <th>Number of Species</th> </tr> </thead> <tbody> <tr> <td>Trees</td> <td>250</td> </tr> <tr> <td>Herbs</td> <td>109</td> </tr> <tr> <td>Shrubs</td> <td>70</td> </tr> <tr> <td>Vines</td> <td>58</td> </tr> <tr> <td>Epiphytes</td> <td>96</td> </tr> <tr> <td>Palms</td> <td>3</td> </tr> <tr> <td>Ferns</td> <td>6</td> </tr> <tr> <td>Total</td> <td>505</td> </tr> </tbody> </table>	Habit	Number of Species	Trees	250	Herbs	109	Shrubs	70	Vines	58	Epiphytes	96	Palms	3	Ferns	6	Total	505	
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Total	505																						
Waste*	Generated amount	Power plant construction site	Monthly	Total of generated amount (weight or volume)	Construction contractor																		

Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
	Not applicable for this period. In 2023 starts the construction of plant.				

*Appropriate waste management including disposal of sludge will be implemented in accordance with Law for the Integrated Management of Residues (Law 8839), and in reference to Resolution No. 1948-2008-SETENA17 (page26).