Greenko Energies Private Limited
(CIN: U40109TG2000FTC034990)

Ref: GEPL/Nodal officer/Forest-SPSP/210301 Dated 01.03.2021

To

Addl PCCF-cum- Nodal Officer (FCA)
Rajasthan Forest Dept., Aranya Bhavan,
Jaipur, Rajasthan

Sub: Diversion of 540.1769 ha of Forest Land for development of Shahpur (2520 MW) Pumped Storage Project, Baran District, Rajasthan by M/s Greenko Energies Pvt. Ltd - reg

Ref: 1. Online application Proposal No. FP/RJ/HYD/121439/2021 for diversion of Forest Land 540.1769 Ha.
2. Your office Online EDS dated 15.02.2020.

Sir,

Kind attention is invited to the ref (1) above, wherein M/s Greenko Energies Pvt. Ltd (GEPL) has submitted online application for diversion of forest land 540.1769 Ha for development of 2520 MW Pumped Storage Project in Baran District, Rajasthan.

In furtherance to the said forest diversion application of GEPL, State forest department has sought clarification vide ref (2) above.

In view of the above, point wise reply to the clarifications sought is herewith attached for kind information and necessary action.

Thanking you,
Yours faithfully,

For M/s **Greenko Energies Pvt. Ltd.**

Greenko Energies Private Ltd.

Authorized Signatory

Encl: As above

Full title of the Project	:	Construction of Shahpur (2520 MW) Pumped Storage Project by M/s Greenko Energies Private Limited, in Hanumanthkhera, Mungawali villages, G.P-Subhdhara; Baint Village, G.P-Bichi; Sahjanpur, Ballarpur Villages, G.P-Kasba Nonera; Kaloni, Shahpur Villages, G.P-Mundiyar; Tehsil-Shahbad; Baran District, Rajasthan.
Proposal no	:	**FP/RJ/HYD/121439/2021**
Date of Proposal	:	03-02-2021
Diversion Area	:	540.1769 Ha

Reply to the additional Information/Clarifications sought by Additional Principal Chief Conservator of Forests (Forest Conservation) and Nodal Officer (FCA).

S. No	Query	Reply
i	The proposal should be submitted either by water resource department of energy department or their technical report should be uploaded.	• The Shahpur PSP is a self-identified project, hence necessary permission, if any shall be applied and obtained by the Project Proponent – Greenko Energies Pvt. Ltd. only. Greenko has been in the process of evaluating suitable locations for such Pumped Storage Projects for over 2 years and has identified suitable location in Shahabad Tehsil, Baran District, Rajasthan for the proposed Shahpur Pumped Storage Project. The upper reservoir is proposed to be located on flat / gradually sloping land which is suitable for creating the desired gross storage capacity, wherein about 45% of the identified area is in forest land whereas the entire location of lower reservoir is in forest land. • Greenko Energies Pvt. Ltd had submitted request for allocation of water to Water Resources Dept. (WRD), Govt. of Rajasthan for the proposed Project vide letters dated 20.02.2020 and thereafter on 31.07.2020 and 13.01.2021 for requesting increased quantum of water on account of re-alignment of our project boundary based on the directions of WRD. Copy of the letters are enclosed at **Annexure-1** for your reference. • Further, the project has been registered with Rajasthan Renewable Energy Corporation Limited (RRECL), which is the nodal agency of Govt. of Rajasthan, Department of Energy, for the promotion and development of Renewable Energy Projects in the state of Rajasthan. A copy of the letter from RRECL dt. 28.01.2021 for approving the registration (effective 15.01.2021) is enclosed at **Annexure-2** for reference. The said letter inter-alia directed that project proponent will ensure the compliance of all Rules, Regulations, Policy Provisions and Guidelines issued by Government of India and Government of Rajasthan for implementation of the Project.

S. No	Query	Reply
		• The copy of Pre-Feasibility Report (PFR) of the proposed project was already been shared with WRD and all concerned departments of Govt. of Rajasthan and the same was also submitted as part of Forest Diversion Proposal (Part-I). • Further, Standing Empowered Committee (SEC), Govt. of Rajasthan in its meeting dt. 08.02.2021 under the Chairmanship of Chief Secretary, has recommended a list of incentives / benefits for the proposed Project under Customized Package, which also includes incentives offered to eligible enterprises under the prevailing Rajasthan Investment Promotion Scheme (RIPS 2019). The matter would be placed in the upcoming meeting of Investment Promotion Board chaired by Hon'ble Chief Minister, Govt. of Rajasthan for final approval of incentives / benefits for the proposed Project, whose estimated investment is about Rs. 30,000 Cr.
ii	Why this proposal taken in forest area. Why the proposal area is not taken in non-forest area	• Pumped Storage Projects (PSPs) are Energy Storage Projects wherein energy is stored in the form of water at high elevations. In present scenario of energy development through renewable energy sources in India, energy storage projects have become the need of the hour, because GOI has fixed ambitious targets of harnessing 175 GW of Renewable Energy by 2022 and 450 GW by 2030. Without availability of energy storage projects, these targets will be difficult to achieve and as on date, Pumped Storage technology is the only proven and reliable form of energy storage the world over. • Energy Storage Projects (ESP) convert intermittent or 'infirm' power generated by Renewable Energy (RE) sources into 'firm' RE power by reducing variability of output of such projects into the grid and ensuring availability of firm power round the clock or for a particular period based on demand. ESPs, in conjunction with Solar / Wind or Solar-Wind Hybrid Projects, offer a host of advantages including, but not limited to, flexibility of the grid system with dual characteristic of generation and consumption of energy (generate energy in one time slot and consume energy in another time slot), peak hour shifting, load generation balancing and peak load management, contingency and operating reserves, frequency regulation and ancillary service support to the grid thereby contributing to overall grid balancing and stability.

Greenko Energies Private Ltd.

S. No	Query	Reply
		• These PSPs are an essential requirement for Renewable Energy rich states like Rajasthan because these projects enable large scale harnessing of Renewable Energy source and make them schedulable and dispatchable by overcoming the uncertainty and intermittency associated with renewable Energy sources. This project is by far the largest PSP proposed to be developed in India and also "World's Largest Renewable Energy Asset" which is planned to be completed by 2023-24 thereby establishing Rajasthan as a model state in the adoption of solutions for a sustainable future and putting the state in the forefront of Energy Storage revolution. Hence, this would be a very prestigious project for the state of Rajasthan. • PSP is a special type of project which requires very specific topographical and geological site conditions. These projects require creation of two reservoirs at substantial elevation difference and with geological conditions such that those reservoirs are capable of retaining water for longer periods. Since water is required to be stored in form of energy, availability of water source in close vicinity is also an essential requirement for finalising locations of these projects. For initial filling of the reservoirs i.e., water would be drawn from the source only once for the life-time of the Project and subsequently for compensation of losses due to evaporations, etc. on annual basis. Another major requirement is that both these reservoirs shall be close enough to make it technically suitable. It is very difficult to identify such sites in one location that satisfies all these conditions and hence, very few locations have been identified across the country for setting up such type of projects. Also, our project is considered to be Off Stream Closed Loop project as it would be set up away from the riverine system and hence technically and environmentally more suitable. • Accordingly, this project has been proposed to be set up at this particular location because it meets all the above-mentioned requirements like suitable Topographical and Geological conditions, availability of substantial head difference at short distance with Kunnu River as source of water. Also, this location has been firmed up after evaluating suitability at other locations in the state of Rajasthan.

S. No	Query	Reply
iii	Alternative Non forest area should be explore for this project	As mentioned against reply to Point (i&ii) above, Pumped Storage Project (PSP) is a site-specific project. These projects require very specific topographical and geological site conditions. • While finalizing the layout of the project, we have studied all possibilities to have minimum land requirement for the project and at the same time, we have also studied the possibilities of implementing the Power House underground or surface to reduce our land requirement. As per geological conditions of the area, Powerhouse is in Shale Rock area wherein it is technically not advisable to go for underground Powerhouse. Therefore, it was mandated to adopt the Surface Powerhouse in our layout. • While finalising the location of all other project components, efforts were made to keep the requirement of forest land as minimum as possible, but the options were very limited. Efforts have been made to locate Upper Reservoir on private and govt. lands as far as possible and accordingly the layout of Upper Reservoir was firmed up within the permissible technical parameters of the Project. Since the entire area around Lower Reservoir and other components of the Project is only forest land, it has become impossible for us to find suitable alternative location other than forest land within the acceptable technical requirements. It is pertinent to note that with all these conditions and limitations, forest land requirement of our proposed Project is minimum as compared to any other project of similar capacity of any other source. • Keeping all these in view regarding site specific requirements of these Pumped Storage Projects and land conditions in the area, project has been conceived with barest minimum forest land requirement within available limitations and restrictions.

Date: 02.03.2021
Place: Hyderabad

Gopi Krushna Nikku
Authorised Signatory

For Greenko Energies Private Ltd.
Authorized Signatory

Greenko Energies Private Limited
(CIN: U40109TG2000FTC034990)

20th February 2020

To:

The Commissioner
Bureau of Investment Promotion, Dept. of Industries
Government of Rajasthan
Udyog Bhawan, Tilak Marg
Jaipur – 302 005

Dear Sir,

Sub: Greenko's amended proposal to develop 2520 MW Standalone Pumped Storage Project at Shahpur, Baran District, Rajasthan

Ref: Our earlier proposal dated 8th January 2020 for the development of 2,080 MW Standalone Pumped Storage Project at Shahpur, Baran district, Rajasthan

With reference to the above, we would like to submit our amended proposal for the development of 2,520 MW Standalone Pumped Storage Project (SPSP) at Shahpur, Baran district, Rajasthan **with 2,520 MW of generation capacity and 17,640 MWh of Storage Capacity** (2520 MW x 7 hrs.).

The key features of the Shahpur PSP are as follows, more details available in the enclosed PFR:

Location	Shahpur village, Shahabad Tehsil, Baran district, Rajasthan
Generation Capacity	2,520 MW
Storage Capacity	17,640 MWh (7 hours / cycle)
Response time	< 60 Seconds
Cycle Efficiency	80% (that is, output energy / input energy)
Rated Head	~157 meters
Interconnection	- Nearest CTU (Central Transmission Utility) sub-station (Anta/Baran); - Nearest RVPN (Rajasthan Vidhyut Prasaran Nigam) sub-station;
One-time water requirement	• The proposed project will utilize **1.63 TMC/46.16 Million Cumecs** of water on non-consumptive basis for close-loop cycling of water. Additionally, dead storage of 0.07 TMC would need to be maintained. • Therefore, about **1.70 TMC/48.14 Million Cumecs** for one-time filling of the lower reservoir is proposed to be taken up from the nearby water source (Shahabad Kuno river) and annual recouping of 0.15 ~ 0.20 TMC will be required to compensate for evaporation losses, etc. • Both Upper and Lower Reservoirs will be constructed by Greenko.

As you are aware, India is leading the world's Renewable Energy (RE) revolution and is on track to achieve its ambitious goal of installing 175 GW of RE capacity by 2022. Rajasthan's contribution is commendable as the state has already installed ~9,000 MW of RE capacity[1]. Today, even though Wind & Solar are the lowest-cost

[1] *Source: Govt. of India, Ministry of New & Renewable Energy (MNRE)*

source of RE, however, the inherent infirm nature & rigid non-schedulability of RE presents a huge challenge for integrating large RE capacities into the Indian grid while maintaining grid stability.

The twin challenge of increasing RE capacities on one hand, coupled with the dynamic intra-day demand variations of the States on the other (due to different demand patterns of the various consumers, such as industries, domestic, agriculture, commercial, electric vehicles, railways, etc), cannot be met by the traditional standalone power generation technologies such as coal, nuclear, solar & wind. The current scenario, one without significant energy storage base in India, is leading to sub-optimal utilization of the existing thermal and renewable assets, resulting in (i) high fixed-cost pass-through per kWh, and (ii) curtailment / back-downs, causing avoidable burden to the DISCOMs & consumers and significant challenges for reliable grid operations.

In this context, Standalone Pump Storage Projects (SPSP) present a viable and time-tested solution to the critical and urgent need for creating energy storage, and the overall drive towards a "smart" grid, as they offer a number of advantages:

1. SPSPs act both as load/demand at the time of low-demand/over-supply in the grid as well as generation/supply at the time of high-demand/under-supply in the grid.
2. Technologically proven and time-tested, globally there are about 270 PSPs (operational + under construction) with approximately 127,000 MW of capacity. In India there are 9 operational PSPs + 2 under construction PSPs + 3 PSPs at Survey/Approvals stage, totaling over 9,000 MW.
3. SPSPs do not disturb the existing natural water systems/irrigation systems, as they are close-loop projects, and require only one-time water filling for the entire lifetime of 50 to 100 years, in addition to minor recouping annually for make up for evaporation and other losses.
4. SPSPs can be built in non-mountainous plains, and therefore are compact and can be constructed much faster than traditional hydro projects, leading to favorable cost economics.

Govt. of India has already recognized the critical need for promoting Storage and has taken several transformational steps, such as creation of National Energy Storage Mission (NESM), Ministry of New and Renewable Energy's (MNRE) Wind-Solar Hybrid policy and its amendment broadening the definition of Storage by including Pumped Storage and other technologies in addition to chemical form of Batteries.

Greenko Group, India's largest and leading RE Developer (*Group details enclosed herewith along with technical and financial credentials*), has taken a giant leap in this direction by conceptualizing to set-up multiple SPSP led Wind-Solar-Storage projects, with the objective of supplying on-demand/schedulable RE from its Integrated Projects. **The first two such projects are being built in the state of Andhra Pradesh (Pinnapuram: 1,200 MW PSP + ~3,500 MW Solar-Wind generation) and Karnataka (Saundatti: 1,260 MW PSP + ~3,500 MW Solar-Wind generation)**.

The need for large-scale energy storage services is increasingly being felt in Rajasthan as well leading to very high RE penetration with large intra-day demand variations, causing grid balancing challenges resulting in significant inefficiencies in energy planning on account of lack of flexible generation capacity.

Also, Greenko Group's success in a recently concluded tender conducted by SECI having been awarded 900 MW out of 1200 MW of RE + Storage with assured supply in Peak Hours has fuelled the need for such type of power procurement in the country. Several thousands of MW of RE + Storage / Standalone Storage capacities

are being planned on a national scale on account of its lower power purchase cost when compared with thermal power and the state of Rajasthan may benefit immensely from this impetus as our proposed Standalone Pump Storage Project will offer tremendous socio-economic benefits for the state.

Some of these benefits include:

1. **Fresh investments of ~Rs. 10,000 – 15,000 Crores in the State of Rajasthan over the next 4-5 years;**
2. **Jobs & employment creation for ~8,000 people during construction, and ~1000 people for operation of the Project for the entire life of the project (that is, more than 50 years);**
3. **Skill Development for thousands of people who can find employment elsewhere in the country in this emerging segment;**
4. **Boost to the local industry, esp. small-scale industries (construction, manufacturing, transportation, real estate, tourism, etc);**

We are keen to work closely with the State of Rajasthan and contribute towards achieving leadership of Rajasthan in the clean energy and storage space, where our proposed Shahpur SPSP will make huge contributions. To enable this project and to secure the benefit of the SPSP for the State, we have the following requests from the Government of Rajasthan:

1. **One-time Water Allocation of 1.70 TMC (i.e. 1.63 TMC Live storage + 0.07 TMC dead Storage) on non-consumptive basis from the nearby Shahabad Kuno River as per the Industrial Policy of the State Government, and annual recouping water allocation of around 0.15 ~ 0.20 TMC.**
2. **Single Window Clearances under the Rajasthan Enterprises Single Window Enabling and Clearance Act, 2011, and applicable incentives under the Rajasthan Investment Promotion Scheme 2019 (as amended from time to time).**

In this context, we request your consideration of our requests as state above and seek your direction on the next steps.

Yours Sincerely,
For Greenko Energies Pvt. Ltd.

……
Authorized Signatory

Copy to:

1. Principal Secretary, Department of Energy, Government of Rajasthan
2. Additional Chief Secretary, Dept. of Industries, Government of Rajasthan
3. Principal Secretary, Water Resourced Department, Government of Rajasthan

Enclosures:

1. Pre-feasibility Report (PFR) of the 2,520 MW Standalone Pumped Storage Project in Shahpur, Rajasthan

31st July 2020

To:

The Chief Engineer
Water Resources Dept., Rajasthan
Jaipur

Dear Sir,

Sub: Greenko's proposed Standalone Pump-Storage Project (2,520 MW) at Shahpur, Baran district, Rajasthan

Ref:

1. Your letter dt. 24.06.2020 regarding observations from the office of ACE, Water Resources Zone, Jaipur

With reference to above we have updated our PFR incorporating changes as required and same is enclosed herewith for perusal at your end please. The key changes in the PFR are as below:

1. The location of lower reservoir has been shifted by around 200 m towards hill to avoid encroachment into submergence area of Hanotiya Barrage.
2. Evaporation losses have been considered as 20% as per suggestions from the dept. However, the same is subject to verification by the statutory authorities during the concurrence process of DPR.
3. With these changes the live storage requirement has increased slightly, i.e., it will be now 1.65 TMC as against our plan of 1.63 TMC earlier. Hence, our requirement of first and one-time filling of water from River Kunnu will be amended from 1.785 TMC (50.54 MCM) to 1.795 TMC (50.82 MCM).

We sincerely hope this is in line with your requirements for granting approval for water drawl for our proposed project and herewith submit the updated PFR for your perusal.

Yours Sincerely,
For Greenko Energies Pvt. Ltd.

…….
Authorized Signatory

Copy to: The Commissioner - BIP, Dept. of Industries, Government of Rajasthan

13th January 2021

To:

The Chief Engineer
Water Resources Dept.,
Govt. of Rajasthan
Jaipur

Respected Sir,

Sub: Greenko's proposed Standalone Pump-Storage Project (2,520 MW) at Shahpur, Baran district, Rajasthan

Request for increase in water allocation from 1.795 TMC (50.82 MCM) to 1.87 TMC (52.96 MCM) – Reg.

Ref:

1. Our letter dated 31.07.2020 regarding submission of updated Pre-Feasibility Report

This letter is in continuation with our earlier communications and the above referenced letter regarding our proposed Standalone Pump-Storage Project (2,520 MW) at Shahpur, Baran district wherein we had requested for one-time filling of 1.795 TMC (50.82 MCM) of water from River Kunnu and appropriate quantum of water for annual recoupment on account of evaporation losses as per suggestions from WRD, Govt. of Rajasthan, Jaipur and subject to verification by the statutory authorities during the concurrence process of DPR.

We wish to inform you that the one-time filling requirement of our proposed Pumped Storage Project has been enhanced to 1.87 TMC (52.96). Also, quantum of annual recoupment corresponding to the annual losses based on the amended area capacity table included in the updated Pre-Feasibility Report (PFR), which would be submitted to you in due course, would need to be assessed and estimated by WRD as per the standard practices & methodology followed by your office.

The main reasons for the revision of our earlier proposal are:

1. After the grant of TOR by MoEF (Ministry of Environment, Forest & Climate Change, Govt. of India), ground survey was taken up at site and on evaluation of actual data, it was observed that actual surveyed contours & elevations were slightly different from earlier envisaged through web based data.
2. We have had pre-contract discussions with the proposed EM venders for supply of reversible turbines for this project wherein they have suggested efficiencies for consideration of this project, which are slightly higher than what we had assumed earlier.
3. Owing to variation in survey data, the area capacities of both reservoirs have undergone changes resulting in change in live and dead storage capacities.
4. On account of increase in efficiencies to be adopted and marginal change in net head value, there is a reduction in design discharge for the Project

Based on the above reasons, design optimization of our proposed Project was carried out resulting in the revision of our earlier submitted PFR. Major changes in our revised proposal are as below:

1. The live storage requirement for the project has now decreased to 1.605 TMC as against 1.64 TMC earlier
2. The dead storage of both the reservoirs has increased from 0.145 TMC to 0.26 TMC
3. Over all first filling requirement for the project is now 1.87 TMC as against 1.795 TMC earlier
4. All other project parameters are same as earlier

We request your understanding and consideration of our requests as re-iterated below:

1. Approval for allotment of First-time water intake of 1.87 TMC (52.96) (increased from 1.795 TMC / 50.82 MCM).
2. Corresponding revision in the quantum of water towards annual recoupment to be assessed and estimated by WRD and subject to verification by the statutory authorities during the concurrence process of DPR.

Thanking You,

Yours Sincerely,

For Greenko Energies Pvt. Ltd.

Authorized Signatory

Annexure-2

RAJASTHAN RENEWABLE ENERGY CORPORATION LIMITED
(A Government of Rajasthan Undertaking)
E-166,Yudhisthir Marg,C-Scheme,jaipur
CIN No. U40101RJ1995SGC009847
Tel:2225859/2229341/2221650/2229055 Fax:0141-2226028
Website:www.rrecl.com

No.F12/0005/RREC/Hybrid/GREENKO ENERGIES PRIVATE LIMIT/2012/D-0340 **Date: 28/01/2021**

GREENKO ENERGIES PRIVATE LIMITED,
PLOT NO 1071 ROAD NO 44,
JUBILEE HILLS,
Hyderabad Andhra Pradesh-500033

Sub: Registration of 4500 MW Wind-Solar Hybrid Power Project with Storage System (Reg. No. H/0005/2019) under Rajasthan Wind and Hybrid Energy Policy, 2019

This has reference to your application for registration of 4500 MW Wind-Solar Hybrid Power project with Storage System in Village Shahpur, District Baran, Pali & Jaisalmer. In this connection, registration charges Rs 30, 00,000 plus GST Rs 5,40,000 @18% (Total amounting to Rs. 35,40,000/-) has been received through RTGS in RREC Account.

In view of this, your proposals for setting up of 4500 MW Wind-Solar Hybrid Power Projects with Storage Systems (Pump Storage Plant) has been registered vide Reg. No. H/0005/2019 w.e.f. 15.1.2021 under clause 22.4 of Rajasthan Wind and Hybrid Energy Policy, 2019 subject to condition that:

1.You will ensure the compliance of all Rules, Regulations, Policy provisions and Guidelines issued by Government of India and Government of Rajasthan for implementation of the project
2.Also that In case, if any additional financial liability arises on account of registration charges due to change in Policy/Rules, same shall be deposited by you as & when demand raised by RREC. However, this registration will not confer any right on the Developer/Power Producer and will not create any obligation on the part of RREC.
3. In case, allocation of capacity made in multiple phases, the additional registration charges will have to be deposited by you for each phase to RRECL.
4.You will ensure to provide the assessment of solar resource certified by NIWE/NISE as per MNRE guidelines, if required.
5.Non-compliance of any relevant Rules, Regulations, Policy provisions and Guidelines issued by GoI and GoR shall lead to revocation of the registration.

Director (Technical)