

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI**

IN THE MATTER OF:

Original Application No. 66 of 2020 (SZ)

Tribunal on its own motion SUO MOTU Based on the reports received from TNPCB on Oil leakage from ONGC pipeline in Thiruvarur District.

... Applicant(s)

Versus

The Secretary to Govt. of Tamil Nadu and Others

... Respondents(s)

Original Application No. 193 of 2020 (SZ)

Tribunal on its own motion-SUO MOTU Based on the News item in Dinamalar Newspaper, Chennai Edition dated 24.09.2020, "Paddy field with crude oil as ONGC pipeline leaks"

... Applicant(s)

Versus

The Chief Secretary to Govt. of Tamil Nadu and Others

... Respondents(s)

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Place: Bengaluru

Date : 15.12.2020



S Suresh
DEPONENT

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Report of the Joint Committee
(As per Hon'ble National Green Tribunal, Southern Zone, Chennai
Order dated 11.05.2020 & 20.07.2020 in OA no. 66/2020 and
Order dt. 04.11.2020 in OA No. 193/2020)

1. Background

The Honourable National Green Tribunal, Southern Zone, Chennai, in the matter of OA No. 66 of 2020 directed on 11.05.2020 as;

“.....5. We also feel it appropriate to constitute a committee comprising of (1) Senior Officer of Central Pollution Control Board, Regional Office, Chennai (2) Senior Officer from Tamil Nadu Pollution Control Board (3) Senior Soil Scientist from the Tamil Nadu Agricultural University, Coimbatore and (4) District Collector, Tiruvarur to inspect the area in question and submit status as well as action report, including assessment of damage caused to environment including fertility of the land, remedial measures taken by ONGC and whether it is sufficient and whether any compensation for damage caused to environment as well as damage caused to the land owners affected and submit a report to this Tribunal within a period of two months. Central Pollution Control Board, Regional Office, Chennai will be nodal agency for the purpose of coordination and providing logistics for this purpose. Registry is directed to communicate this order along with paper report and report of Pollution Control Board received to the above officials through e-mail immediately so as to enable them to comply with the direction. Committee is also directed to submit the report to this Tribunal through e-mail at ngtszfiling@gmail.com or e-filing before the time specified above....”

In compliance to the Hon'ble tribunal order, the committee has organised preliminary meeting on June 30, 2020 through VC along with officials of ONGC and submitted the interim report to the Hon'ble Tribunal with the following suggestions;

Committee felt that the steps/ measures taken by ONGC for the control of pipeline leakage are not sufficient, because the leakages and its locations are being identified after physical appearance of oil on the soil surface. Pipelines are being laid 2mt. below the ground level. After deliberate discussions, the following measures are suggested by the committee to avoid oil pipeline leak and to maintain the soil fertility.

- 1) *Present method of flow based measurement at receiving end to identify the leakage of oil is not effective, because exact location of oil leak point is not able to be identified until its physical appearance in the top soil. The flow based measurement shall be carried out by providing flow meters in all pipelines with certain distance from well to receiving point, so that the area of pipeline leak shall be identified easily at initial stage itself. These flow meters shall be connected to any system like SCADA, PLC etc.*
- 2) *The periodic assessment of Pipe Integrity (including internal crack, corrosion & erosion) shall be made at least once in five years, so that the status of the pipeline shall be known and accordingly replacement period for the pipe shall be decided.*
- 3) *Pigging operation shall be carried out to reduce water accumulation and subsequent scaling & corrosion inside the pipeline.*
- 4) *External Corrosion Protection of pipeline shall be provided in all underground pipelines such as sacrificial anode method, impulse current method, poly ethylene coating etc. to avoid external corrosion of pipe.*
- 5) *Revalidating of appropriate inhibitors and rate of feeding based on well fluid characteristics (crude oil), can be done by frequent sampling and analysis of well fluid.*
- 6) *ONGC has informed that old pipelines are flushed once if it is not going to be used further in future. Evidence shall be provided to the committee during field visit to ensure that old unused pipelines are flushed properly.*
- 7) *ONGC shall also submit evidence of mothballing of pipeline which is temporarily not in use.*
- 8) *ONGC informed that the oil spilled soil (contaminated soil) is removed from the farmland and taken for in-house bioremediation. The contaminated soil excavated area is re-filled with soil taken from nearby farmers field or other location. It was informed*

that the refilled soil is also having good fertility. However, during this course of action the refilled soil quality should be tested as well as it should possess similar characteristics of the existing natural farm soil so as to avoid yield loss.

9) *ONGC is advised to carry out the assessment of soil quality in all locations, wherever the soil is refilled due to oil spillage/leakage and accordingly corrective measures needs to be taken.*

10) *An action plan for continuous monitoring of affected areas periodically by ONGC shall be submitted to avoid long term issues.*

And also the committee has requested time for carrying out field inspection considering the pandemic situation. Accordingly, Hon'ble Tribunal granted time and directed to submit the report on or before 29.09.2020.

After the relaxation on restriction of travel by Govt. of TN, the committee has carried out inspection on 10.09.2020 and collected the soil samples in & around the affected area of both the sites. The sampling & analysis were carried out by Tamil Nadu Agricultural University, Coimbatore.

Further, the committee requested time for carrying out analysis of the samples collected and submission of final report.

In the matter of OA No. 193 of 2020 order dt. 04.11.2020, Hon'ble NGT(SZ) directed as follows;

".....we direct the committee appointed by this Tribunal in O.A. No. 66 of 2020 to inspect the area in question as well as and submit the nature of soil contamination caused on account of the oil leak and what are the nature of remedial measures to be taken to make good the agricultural land fit for cultivation.

Considering the circumstances, we feel that this case also can be posted along with O.A. No. 66 of 2020 which is now posted to 11.11.2020, so that a common order can be passed as to what are all the future steps to be taken to avoid such incidents in future and the common remedial measures to be taken by the ONGC in such cases.....”

2. Details of sampling

Joint committee had onsite visit and meeting at Tiruvarur to inspect and discuss the effect of underground crude oil leakage incidences occurred in the farmers fields laid with ONGC pipelines on 11.9.2020. During the field visit, soil and water samples were collected from the affected and non-affected fields of both the sites and assessed for their soil fertility. The details on the field visit and the soil fertility assessment made are furnished below:

Site I : Farmer field at Keezhapadugai village (Kmp #44 line leakage, 28.04.2020)

During the field visit, discussions were held with the farmer Mr. Velraj, owner of the field about the incidence occurred, remedial measures taken and compensation paid by M/s. ONGC, Tiruvarur. It was reported that an area of 2 m x 2 m was affected by the crude oil leakage which was excavated and refilled with the soil collected from nearby fields. The farmer confirmed the receipt of compensation from ONGC, removal of the contaminated soil and refilling with the soil collected from adjacent fields. Currently the field was sown with rice crop and germination was good.

A Profile was opened in the affected area where the crude oil leakage occurred and soil samples were collected upto a depth of 1.20 m (GPS co-ordinates: N10.45420 / E079.36998). Though no oily appearance was observed in the surface soil, samples collected from the deeper depths showed the presence of oil.



Profile digging and sampling at the site of oil leakage



Discussions with the farmer



Visit to the site of oil well *Kmp #44*



View of the field direct sown with paddy



Oily appearance of the excavated profile soil

Visit to the affected farm site I and sample collection (Keezhapadugai village)

The soil fertility assessment made in the site revealed no much variation in all the soil physical properties viz., bulk density, particle density and porosity in the soil samples collected from the affected and non-affected areas (Table 1). The soil texture was clay in the upper soil depth of 0-45 cm and in the lower depths it was clay loam in nature. The basic soil properties like pH and electrical conductivity of the soil samples increased with the soil depth. The soil

samples were slightly alkaline in reaction (8.33 to 8.57) and saline in lower depths from 45 cm onwards upto 1.20 m (1.21 to 1.56 dS m⁻¹). Compared to the non-affected field, 0.50 to 1.5 unit increase in pH at all the profile depths and 5-10 fold increase in the salinity at lower depths (> 60 cm) was noticed in the profile. An irregular trend of decrease and increase was noticed in organic carbon content of the soil with increasing soil depth.

Considerable reduction (40-50%) in available nitrogen and potassium with increasing soil depth was observed (Table 2). No such changes in available phosphorus, calcium, zinc and manganese availability in the soil samples were noticed as compared to the samples collected from non-affected field. The availability of sulphur and magnesium though showed not much differences, higher values were observed in the profile depth of 60-120 cm. The Cu and Fe availability was lesser (20%) than the sample collected from the non-affected fields with an irregular trend in boron availability. The heavy metal status in the soil was trace and found below the toxicity limit in all the samples and showed no significant variation between the affected and non-affected soil samples (Table 3).

The microbial load in the soil samples showed drastic reduction in the population when compared to samples collected from non-affected fields. More than 50% reduction in bacteria, fungi and actinomycetes population was observed in the affected field as compared to the non-affected field. The reduction in porosity and lesser nitrogen availability observed in the site might have resulted in lesser microbial population.

Two water samples each collected from nearby affected field and also at non-affected areas were analyzed for various quality parameters which indicated no hazard of all cations and anions. The water quality was also good hence can be used for irrigation (Table 8).

Site II: *Farmer field at Keezhaerukkattur village (Kmp # 46 & 48 line leakage, 06.04.2019)*

The farmer has taken up sowing with the rice variety CR 1009 and upon discussions he has said that approximately 5 m radius area in the field was affected and confirmed the receipt of Rs. 50,000/- as compensation fixed by the District collector, Tiruvarur. Soil samples were collected at surface and also at 15 cm interval in the profile depth upto 120 cm (GPS co-ordinates: N10.44679 / E079.33927). Two water samples each one in the affected field and

nearby area were also collected. The presence of oil in the water as well as in the soil samples collected from the affected field was observed visually.



Discussions with the ONGC officials in the affected field



Collection of soil samples from the affected field



View of the profile taken in the affected site of the field



Water with oily appearance in the field sown with paddy

Visit to the affected farm site II and sample collection (Keezhaerukkattur village)

The analytical results of the soil sample collected from the area of crude oil leakage and also in the non-affected field showed greater variation in porosity of the samples collected upto a depth of 0 to 60 cm but no such differences was observed in the particle density and a slight reduction in bulk density. Considerable reduction in the porosity observed upto a profile depth of 75 cm indicated the de-flocculation of soil particles (Table 4). No much variability in the pH was noticed at all depths except at 15-30 cm which was highly acidic in reaction (Table 4). Though the surface soil sample does not have any salinity issues, the sub surface samples collected at the depth of 15-60 cm were having high salinity problem (3.30 to 5.35 dS m⁻¹). The surface sample was slightly calcareous while the

subsurface samples were non calcareous in nature. An increase in organic carbon content, available potassium, sulphur, and copper availability was recorded with increasing soil depth and the increase was marked with potassium and copper (Table 5). No much variability in calcium, magnesium, phosphorus and slight reduction in boron availability was registered in the samples. The heavy metals (Cd, Pb, Cr, Ni) status in both affected and non-affected areas were well below the toxicity limit (Table 6). The microbial load assessed in the profile samples collected at affected site and surface soil samples collected from non-affected areas showed no significant variability.

The analysis of two water samples each one collected from the affected and non-affected areas revealed no hazardous levels of cations and anions and possesses good water quality indices (Table 8). Both the samples were neutral in pH, non-saline with no hazardous status of various cations and anions.

Characteristics of the oil spilled soil samples excavated and dumped in the ONGC site

Two representative oil spilled soil samples excavated from the fields and dumped in the ONGC site were collected and analyzed for various parameters (Table 7). The physical properties of the soil samples showed no variability and the soil samples were clay loam in texture. The pH of the samples was neutral in reaction, highly saline (2.51 & 3.00 dS m^{-1}) with the organic carbon content of 1.43 & 1.46% . The major nutrient availability indicated medium Nitrogen, low Phosphorus and high Potassium availability.

As regards the secondary and micronutrient availability, all the nutrients were sufficiently available and no toxic level was observed. The heavy metal availability in the soils was also ranged from traceable to low in status. Higher actinomycetes population was noted in the samples followed by fungi and bacteria.

Table 1: Soil physical and physico chemical properties of the soil samples collected from Keezhapadugai village (Site I)

S.No	Sample details	Physical properties				Physico chemical properties			
		Bulk density (g cc ⁻¹)	Particle density (g cc ⁻¹)	Porosity (%)	Texture	pH	EC (dS m ⁻¹)	Org. Carbon (%)	Calcareousness (%)
1.	Non affected field sample	1.33	2.22	42.1	Clay loam	7.01	0.16	0.69	Non calcareous
	Profile samples								
2.	0-15 cm	1.33	2.22	40.3	Clay	7.48	0.21	0.35	Non calcareous
3.	15-30 cm	1.25	1.82	31.3	Clay	8.33	0.26	0.40	Non calcareous
4.	30-45 cm	1.18	2.00	37.5	Clay	8.57	0.32	0.55	Non calcareous
5.	45-60 cm	1.33	2.00	41.2	Clay loam	8.26	1.56	0.86	Non calcareous
6.	60-75 cm	1.33	1.67	38.8	Clay loam	8.42	1.35	0.55	Non calcareous
7.	75-90 cm	1.18	1.82	41.4	Clay loam	8.47	1.21	0.89	Non calcareous
8.	90-120 cm	1.05	2.00	41.4	Clay loam	8.39	1.23	0.25	Non calcareous

Table 2: Nutrient availability in the soil samples collected form Keezhapadugai village (Site I)

S.No	Sample details	Major Nutrient availability (kg ha ⁻¹)			Secondary and Micronutrients availability (mg kg ⁻¹)							
		Nitrogen	Phosphorus	Potassium	Calcium	Magnesium	Sulphur	Zinc	Iron	Manganese	Copper	Boron
1.	Non affected field sample	199	9.0	327	1512	804	14.9	1.13	50.3	29.8	3.42	0.33
	Profile samples											
2.	0-15 cm	137	8.0	327	1344	660	14.6	1.05	21.6	24.3	2.34	0.76
3.	15-30 cm	123	10.0	234	2064	732	13.9	1.16	32.5	14.8	2.69	0.72
4.	30-45 cm	115	9.0	220	1272	924	22.5	2.26	36.0	26.1	1.17	0.40
5.	45-60 cm	90	9.0	186	2040	960	12.9	1.01	40.3	31.1	2.74	0.52
6.	60-75 cm	84	10.0	189	2112	1236	36.3	0.61	29.6	27.8	1.82	0.24
7.	75-90 cm	76	10.0	150	960	1020	33.0	1.27	27.3	23.4	1.62	0.56
8.	90-120 cm	67	10.0	170	1272	828	24.8	1.06	26.5	18.2	1.43	0.68

Table 3: Microbial load and heavy metal availability in the soil samples collected form Keezhapadugai village (Site I)

S.No	Sample details	Microbial load			Heavy metal availability (mg kg ⁻¹)			
		Bacteria (x 10 ⁶ CFU g ⁻¹)	Fungi (x 10 ⁴ CFU g ⁻¹)	Actinomycetes (x 10 ² CFU g ⁻¹)	Cadmium	Lead	Chromium	Nickel
1.	Non affected field sample	7	21	25	1.21	2.96	ND	ND
	Profile samples							
2.	0-15 cm	4	-	11	1.26	3.35	ND	ND
3.	15-30 cm	2	-	4	1.26	3.46	ND	ND
4.	30-45 cm	-	1	3	1.24	3.40	ND	ND
5.	45-60 cm	-	-	1	1.23	3.58	ND	ND
6.	60-75 cm	7	-	4	1.20	3.27	ND	ND
7.	75-90 cm	-	-	3	1.21	3.07	ND	ND
8.	90-120 cm	-	-	6	1.23	3.01	ND	ND

ND-Non deductable

Table 4: Soil physical and physico chemical properties of the soil samples collected from Keezhaerukkattur village (Site II)

S.No	Sample details	Physical properties				Physico chemical properties			
		Bulk density (g cc ⁻¹)	Particle density (g cc ⁻¹)	Porosity (%)	Texture	pH	EC (dS m ⁻¹)	Org. Carbon (%)	Calcareousness (%)
1.	Non affected field sample	1.54	2.22	38.9	Clay loam	7.75	0.41	0.68	Non calcareous
	Profile samples								
2.	0-15 cm	1.50	1.77	15.3	Clay loam	7.45	0.32	0.92	Slightly calcareous
3.	15-30 cm	1.50	1.91	21.5	Clay loam	5.29	5.35	1.43	Non calcareous
4.	30-60cm	1.50	1.91	21.5	Clay loam	7.47	3.3	1.16	Non calcareous
5.	60-75 cm	1.36	1.91	28.8	Clay loam	7.77	1.02	1.40	Slightly calcareous
6.	75-90 cm	1.11	2.00	44.4	Clay loam	7.78	2.25	0.36	Non calcareous
7.	90-120 cm	1.25	2.00	37.5	Clay loam	7.93	1.70	0.27	Non calcareous

Table 5: Nutrient availability in the soil samples collected form Keezhaerukkattur village (Site II)

S.No	Sample details	Major Nutrient availability (kg ha ⁻¹)			Secondary and Micronutrients availability (mg kg ⁻¹)							
		Nitrogen	Phosphorus	Potassium	Calcium	Magnesium	Sulphur	Zinc	Iron	Manganese	Copper	Boron
1.	Non affected field sample	204	11.0	277	1944	696	26.1	1.86	75.6	56.5	2.33	0.91
	Profile samples											
2.	0-15 cm	227	27.0	402	1416	648	24.1	0.90	56.4	37.0	3.37	0.30
3.	15-30 cm	134	10.0	384	960	864	70.0	1.25	62.9	60.5	4.32	0.80
4.	30-60cm	193	8.00	362	1032	588	37.0	1.58	49.6	90.3	4.10	0.84
5.	60-75 cm	188	11.0	393	1368	564	18.8	1.79	41.2	79.7	4.08	0.64
6.	75-90 cm	190	15.0	302	1272	408	12.9	1.00	31.6	49.6	3.44	0.50
7.	90-120 cm	134	8.00	216	1320	864	12.0	0.96	18.7	25.6	2.81	0.50

Table 6: Microbial load and heavy metal availability in the soil samples collected form Keezhaerukkattur village (Site II)

S.No	Sample details	Microbial load			Heavy metal availability (mg kg ⁻¹)			
		Bacteria (x 10 ⁶ CFU g ⁻¹)	Fungi (x 10 ⁴ CFU g ⁻¹)	Actinomycetes (x 10 ² CFU g ⁻¹)	Cadmium	Lead	Chromium	Nickel
1.	Non affected field sample	9	-	11	1.01	1.68	ND	ND
	Profile samples							
2.	0-15 cm	8	1	19	1.00	1.34	ND	ND
3.	15-30 cm	10	2	14	1.02	1.52	ND	ND
4.	30-60cm	12	1	18	1.02	2.24	ND	ND
5.	60-75 cm	6	3	11	1.02	1.79	ND	ND
6.	75-90 cm	7	-	10	0.99	1.78	ND	ND
7.	90-120 cm	5	1	21	1.01	1.97	ND	ND

ND-Non deductible

Table 7: Characteristics of oil spilled excavated soil dumped in the ONGC site

S.No.	Soil properties	Sample 1	Sample 2
Physical properties			
1	Bulk density (g cc ⁻¹)	1.25	1.33
2	Particle density (g cc ⁻¹)	2.22	2.00
3	Porosity (%)	43.8	33.3
4	Texture	Clay loam	Clay loam
Physico chemical properties			
5	pH	7.10	7.21
6	EC (dS m ⁻¹)	3.00	2.51
7	Org. Carbon (%)	1.43	1.46
8	Calcareousness (%)	Slightly calcareous	Non calcareous
Major Nutrient availability (kg ha⁻¹)			
9	Nitrogen	216	204
10	Phosphorus	8.00	11.0
11	Potassium	350	356
Secondary and Micronutrients availability (mg kg⁻¹)			
12	Calcium	1080	1128
13	Magnesium	696	972
14	Sulphur	32.4	9.9
15	Zinc	0.85	1.81
16	Iron	35.3	53.2
17	Manganese	13.5	43.7
18	Copper	2.63	3.45
19	Boron	1.08	0.52
Heavy metals			
20	Cadmium	0.97	1.05
21	Lead	1.87	1.90
22	Chromium	ND	ND
23	Nickel	ND	ND
Microbial load			
24	Bacteria (x 10 ⁶ CFU g ⁻¹)	15	12
25	Fungi (x 10 ⁴ CFU g ⁻¹)	-	27
26	Actinomycetes (x 10 ² CFU g ⁻¹)	7	40

Table 8: Analytical results of the water samples collected from both the sites

S.No.	Parameters	Site I		Site II	
		Sample 1	Sample 2	Sample 1	Sample 2
		Nearby affected area	Non affected	Nearby affected area	Non affected
1	pH	7.61	7.59	7.65	8.10
2	Electrical conductivity (dS m ⁻¹)	0.37	0.27	0.46	0.40
	Cations (meq. L ⁻¹)				
3	Calcium	1.20	0.88	0.96	0.15
4	Magnesium	1.18	0.63	0.63	2.78
5	Sodium	1.20	1.08	2.88	0.96
6	Potassium	0.08	0.07	0.09	0.07
	Anions (meq. L ⁻¹)				
7	Carbonate	Nil	Nil	Nil	0.40
8	Bicarbonate	0.60	0.60	1.20	0.60
9	Chloride	2.80	2.0	2.80	2.80
10	Sulphate	0.09	0.01	0.02	0.02
	Water quality indices	1.10	1.24	3.23	0.79
11	Sodium Adsorption Ratio	1.32	1.36	4.20	1.03
12	Residual Sodium Carbonate	Nil	Nil	Nil	Nil
13	Salt index	-29.1	-27.7	-26.3	-24.2
14	Mg/Ca ratio	0.98	0.71	0.65	18.3

3. Salient conclusions

The soil fertility assessment and water quality appraisal of the samples collected from the affected farmers fields of both the sites revealed the following issues which need to be addressed.

Site I: Keezhapadugai village (Kmp #44 line leakage, 28.04.2020)

- Increasing salinity and alkalinity of the soil samples at lower depth.
- Considerable reduction in available nitrogen and potassium.
- Built up in magnesium and sulphur content in the lower soil depths.
- Reduced microbial load in the samples collected from affected field than the non-affected fields.
- No issues in other nutrients, heavy metals status and soil physical properties.
- Water sample quality was good with no hazardous status of cations and anions.

Site II: Keezhaerukkattur village (Kmp # 46 & 48 line leakage occurred on 06.04.2019)

- Considerable reduction in porosity with no constraints in bulk density and particle density.
- Soil acidification and salinity in the lower depths (15-60 cm).
- Increased status of sulphur, manganese and copper content in the lower soil depths.
- Heavy metal status was well below the toxicity level.
- No change in microbial load between the affected and non-affected fields.
- Water samples possess good quality with no hazard in cations and anions.

The oil spilled soil samples collected from the storage area of the ONGC site has the issue of high salinity and other parameters showed no constraints.

4. Status of Compliance submitted by the ONGC;

ONGC has submitted the compliance based on the suggestions made in the interim report. The compliance along with committee comments are as follows;

- (i) **Present method of flow based measurement at receiving end to identify the leakage of oil is not effective, because exact location of oil leak point is not able to be identified until its physical appearance in the top soil. The flow based measurement shall be carried out by providing flow meters in all pipelines with certain distance from well to receiving point, so that the area of pipeline leak shall be identified easily at initial stage itself. These flow meters shall be connected to any system like SCADA, PLC etc.,**

Standard flow meters are meant for Single phase flow only. Well fluid is a combination of Gas, Oil and Water and hence it cannot be measured using flow meters.

Flow lines lengths varies from 1 km to 8 km and of 4 inch dia. Flow rate from each well also varies from 1 m³ to 15 m³/day (About 50 lit/hour to 500 lit/hour) which is very small quantity flowing through individual flow lines. These flow lines are underground lines and laid mostly through agricultural lands.

Fixing flow meters at intermediate points under ground is not possible. If flow meters are to be installed additional land has to be acquired along the route of the flow lines for cabling. This may further affect the farming process. Probability of leakage also increases if there are more joints in the flow lines. Also as already explained above, flow meters will not measure multiphase flow.

Due to the depleting reservoir pressure, the flow of the well fluid in most of the wells is intermittent (flows in surges). With the SCADA reading of no-flow intervals, we cannot conclude whether well has ceased to flow or there is any leakage in the line unless it is observed for a long duration of time. By that time the undesirable damage to the land would be inevitable. If the leakage is of very minor in nature it is not at all possible to detect it with the SCADA system monitoring.

Connecting them with SCADA is a very cumbersome and tedious process as it involves huge wireless transmission infrastructure required for each well which is not viable. Also the protection of these infrastructure and cables at remote locations against any damage /miscreant act would be required to be ensured. Such practice doesn't exist in any of the Onshore oil industry.

The present methodology for pipe line monitoring and control measures includes patrolling of the flow lines for visual observation and detection of any leakage on the surface, sensitising the villagers and public about the consequences of the leakages and inform the ONGC authorities in case of any eventuality of leakage. Important phone numbers are displayed at the well sites in order to contact the concerned person of ONGC for immediate and timely action.

Comments: There are multiphase flow meters available in market, however considering wide variation in the Gas Oil Ratio (GOR) time to time from wells, accuracy of the meter will be compromised. Intelligent Pigging Studies for all pipelines shall be done periodically. As an additional measure, corrosion monitoring probes or coupons can be installed at each well head to monitor the corrosion rate and optimize the Corrosion inhibitor injection rate, this certainly improves the effectiveness of Corrosion Inhibitors.

- (ii) The periodic assessment of Pipe Integrity (including internal crack, corrosion and erosion) shall be made at least once in five years, so that the status of the pipeline shall be known and accordingly replacement period for the pipe shall be decided.**

Pipeline integrity is checked once in five years by way of Hydro-testing of the pipeline and pressure testing of the line with the existing well fluid once in every two years. (OISD 233)

To overcome the above constraints mentioned in Point no (i) and to achieve the aim of safeguarding the lands through which pipelines are laid from any leakages, ONGC is planning to have Intelligent Pigging Studies for all the flow lines through recent Advance Technology for pigging in non-piggable lines. With this study, the present condition of entire length of the flow lines will be ascertained accurately. Wherever the thickness of the line is observed less due to internal corrosion, cracks, erosion etc., proactively those portions will be replaced to avoid future leakages.

Already vendors for this service are identified and the process of entering into a contract is already started. The contract is in initial phase of estimation and likely to be awarded by end of the Financial Year 2020-21. Once the contract is in place, all the major and critical pipelines based on the life, ROU will be tested for internal integrity.

- (iii) Pigging operation shall be carried out to reduce water accumulation and subsequent scaling & corrosion inside the pipeline.**

Pigging of trunk lines are carried out once in 5 years.

As the existing flow lines are non piggable, regular Liquid N₂ application/ hot oil circulation is being done, to clear water accumulation and to avoid formation of sludge/scales inside the pipe line thereby minimizing the corrosion. Once the contract mentioned in earlier points comes into existence, condition of all flow lines will be known and further proactive actions will be initiated.

Comments: Even though ONGC is carrying out the above said measures, leakage of pipeline is frequently happening, so increase the frequency to minimize the pipeline corrosion. Also an alternate of injecting Corrosion Inhibitors at higher rates to inhibit the water accumulated in pipeline due to low GOR and terrain effect. ONGC can introduce intermittent Corrosion inhibitor injection points along the pipeline and inject the Corrosion Inhibitor through mobile facility periodically, this enables the effective corrosion inhibitor reaches all along the pipeline. A specialist flow assurance study can be performed to verify the impact on corrosion due to varying flow rates, terrain effects etc.

- (iv) External Corrosion Protection of pipeline shall be provided in all underground pipelines such as sacrificial anode method, impulse current method, poly ethylene coating etc., to avoid external corrosion of pipe.**

Presently all pipelines laid are 3 layered poly-ethylene coated pipes to avoid external corrosion. Moreover, Cathodic Protection exists for all the trunk pipelines. Measures are also being taken to execute the same in the well flow lines for recently laid pipelines through a contract (Pipeline Integrity Management System) which will be in place by Jan'2021. Remaining pipelines will be Cathodically protected in a phased manner.

- (v) Revalidating of appropriate inhibitors and rate of feeding based on well fluid characteristics (crude oil) can be done by frequent sampling and analysis of well fluid.**

Oil Line Corrosion Inhibitor being used is procured as per Standard Corporate Specifications and the efficiency of the chemical is tested at ONGC Regional Labs using the well fluids of the Asset. Dosage Rate and Batch Dosing of Corrosion Inhibitor in flow lines are carried out as per the recommendations of the ONGC Research Institutes. Analysis of well fluid characteristics are being carried out regularly in the field laboratories.

Committee appointed by NGT suggested to confirm whether the effectiveness of the chemical dosed from well head end would get diluted and lose its effectiveness when it passes through sagged portions of the pipelines where water accumulation will be more. The same has been asked to our lab and corrective action in our practice would be incorporated if suggested by ONGC Regional lab.

Comments: Suggest to conduct in field test on various corrosion inhibitors from different formulations to ensure the effectiveness of the same.

- (vi) ONGC has informed that old pipelines are flushed once if it is not going to be used further in future. Evidence shall be provided to the committee during field visit to ensure that old unused pipelines are flushed properly.**

The pipelines are disconnected from the well site end and installation end and the lines are blinded /positively isolated after flushing the line for removal of hydrocarbons. Committee appointed by NGT was shown the isolation of old pipeline at KMP#44 well head.

- (vii) ONGC shall also submit evidence of mothballing of pipeline which is temporarily not in use.**

At present there are no pipe lines which are temporarily not in use.

However, in the case of flow lines/pipe lines which are not in use and may be required for the future purpose they are disconnected from the well site end and installation end and the lines are blinded /positively isolated after flushing the line for removal of hydrocarbons. Then they are purged and filled with N2 for safe guarding their life for the purpose of using in the future.

Comments: As the pipelines are not piggable, just purging with nitrogen will not help removing the accumulated water. The water accumulated and left for longer forms dead leg and corrodes the portion of pipeline exposed. ONGC to consider flushing the pipeline with inhibited water (suitably treated or injection with inhibitors)

- (viii) ONGC informed that the spilled soil (contaminated soil) is removed upto affected depth from the farmland and taken for in house bioremediation. The contaminated soil excavated area is re-filled with soil taken from other location. It was informed that the refilled soil is also having good fertility. However, during this course of action the refill soil quality should be tested as well as it should possess similar characteristics of the existing natural farm soil so as to avoid yield loss.**

Presently the contaminated soil of excavated area is refilled up to the depth of 1.2 meter with the soil taken from other location. To ensure good fertility and yield, the soil for refilling is taken from suitable location as suggested by the owner of the land after duly testing the soil used for refilling by the local agricultural department

As suggested by Committee appointed by NGT, henceforth the contaminated soil below the pipe line shall also be removed and refilled with tested quality soil. After refilling the soil shall be tested for Mechanical, Biological, Organic and Microbial population to ensure that they have similar characteristics of existing natural farm soil so as to avoid yield loss.

ONGC shall ensure the affected area is refilled with the suitable good quality soil by coordinating with the local village and district authorities and if required Dept. of Agriculture

Comments: As per statement of ONGC, the soil evacuated is taken for further treatment, whereas the refilling of soil is being done by landowners for which payment is made by the ONGC. As per the study conducted by the committee, the soil possesses the impact due to oil leakage and contaminated soil is not properly removed.

- (ix) ONGC is advised to carry out the assessment of soil quality in all locations, wherever the soil is refilled due to oil spillage / leakage and according corrective measures needs to be taken.**

In addition to the reply mentioned in point no viii, ONGC shall periodically take the soil sample at different locations of the operational areas to have the base data for referring with the affected soil where the leakage happens in the future.

- (x) An action plan for continuous monitoring of affected areas periodically by ONGC shall be submitted to avoid long term issues.**

After the removal of contaminated soil and refilling by suitable soil the land is handed over to the land owner. The visit to the affected areas will be carried out by the ONGC crew and regular feedback /soil testing regarding cultivation and crop yield will be collected for records. Based on the feedback, corrective measures shall be taken including the additional crop compensation based on the recommendations by the local village and district authorities.

Committee appointed by NGT suggested to take surface soil samples along the routes of vulnerable flow lines during non-cultivation periods to ensure there is no residual leakage of very minute nature. ONGC will implement this suggestion once the present cultivation period is over.

Committee appointed by NGT also suggested to carryout CSR activities along with Department of agriculture to improve fertility of the affected lands. Based on the reports of concerned VAO / Revenue Authorities this will be carried out wherever required.

5. Field Observations

- a) ONGC informed that the contaminated soil is removed and taken for further treatment, whereas the refilling of soil is done by the landowner, for which the payment is made along with compensation.
- b) Presence of oil in the sub surface soil was observed in the oil leakage area, which shows that contaminated soil is not removed completely.
- c) The oil leak happened on 06.04.2019 at Keezhaerukkattur village (Kmp # 46 & 48) pipeline was repaired by ONGC and compensation has been paid along with the cost of soil refilling to the land owner S. Selvaraj. Whereas, during joint committee visit it is observed that the contaminated soil is not removed in this site. ONGC informed that landowner has not allowed to remove the contaminated soil. Committee informed that with the help of local authority, ONGC shall take necessary action for the removal of contaminated soil.

6. Compensation paid by ONGC:

ONGC is paying compensation based on the Tiruvarur District Revenue Officer proceeding dt. 25.04.2018 for the period 01.01.2018 to 31.12.2020 (Copy enclosed as **Annexure 1**). The details are as follows;

Period	Crop Details	Compensation Amount per Acre per Annum
01.01.2018 to 31.12.2020	Paddy, Cotton, Gram, Lentils, Sugarcane and Banana including cash crops	Rs 1,10,000/-

The above compensation will be reviewed again after 31.12.2020. Moreover, ONGC informed that they will be paying additional compensation in successive years, if growth is affected.

The compensation paid to Mr. C. Velraj for the affected area 400 Sq. mt. is Rs. 10,868/- and Mr. S. Selvaraj for affected area 1850 is Rs 50,000/- for the incident happened on 20.04.2020 at KMP 44 line and 06.04.2019 at KMP 48 line respectively. The copy submitted by ONGC is annexed as **Annexure 2**.

7. Committee Opinion/Suggestion in the matter of OA No. 193/2020

In the matter of OA No. 193/2020, Hon'ble Tribunal has taken SUO MOTU based on the News item in Dinamalar Newspaper, Chennai Edition dated 24.09.2020 titled "Paddy field with crude oil as ONGC pipeline leaks". ONGC oil pipeline leakage was happened on 22.09.2020 at Wells KMP# 64 in the field owned by Thiru. Sivashanmugam, S/o. Dhanasekaran, in survey No. 72/1, Erukattur Village, Koothanalur Taluk. The status report was filed by the District Collector, Tiruvarur as well as by ONGC, in which the details of soil test and its contamination and remedial measures was not furnished. So, Hon'ble Tribunal directed the committee appointed in the OA No. 66 of 2020 to inspect the area in question as well as and submit the nature of soil contamination caused on account of the oil leak and what are the nature of remedial measures to be taken to make good the agricultural land fit for cultivation.

Joint committee is of the opinion that the nature of accident material and soil quality is similar to the event that happened in earlier case. The nature of the affected soil quality collected & tested in the matter of OA No. 66/2020 is briefed in the report. Since it is a similar type of issue, the quality of affected soil would possess the same nature. So, the remediation measures suggested in this report is applicable for the present affected site mentioned in the OA 193/2020.

The photographs of the present status of the affected field produced by the ONGC is given below;



Day of Incident



Status as on 21.11.2020

8. Suggestions:

General;

- ONGC shall ensure that, the soil from oil leaked area needs to be completely removed from the location. ONGC should ensure & monitor that, the landowners should not refill with same contaminated soil.
- ONGC shall carry out the assessment of soil quality periodically throughout the pipeline laid area and also to monitor at oil spilled location, so that accordingly corrective measures shall be implemented.

Preventive measures for non-recurrence;

- Intelligent Pigging Studies for all pipelines shall be done periodically to assess the pipeline damage.
- Corrosion monitoring probes or coupons can be installed at each well head to monitor the corrosion rate and optimize the Corrosion inhibitor injection rate, to improve the effectiveness of Corrosion Inhibitors. Suggested to conduct in field test on various corrosion inhibitors from different formulations to ensure the effectiveness of the same.
- Introduce intermittent Corrosion inhibitor injection points along the pipeline and inject the Corrosion Inhibitor through mobile facility periodically, this enables the effective corrosion inhibitor reaches all along the pipeline. A specialist flow assurance study can be performed to verify the impact on corrosion due to varying flow rates, terrain effects etc.
- The periodic assessment of Pipe Integrity (including internal crack, corrosion and erosion) shall be made at least once in five years, so that the status of the pipeline shall be known and accordingly replacement period for the pipe shall be decided.
- External Corrosion Protection of pipeline shall be provided in all underground pipelines such as sacrificial anode method, impulse current method, poly ethylene coating etc., to avoid external corrosion of pipe.
- *Mothballing of pipeline which is temporarily not in use:* As the pipelines are not piggable, just purging with nitrogen will not help removing the accumulated water. The water accumulated and left for longer forms dead leg and corrodes the portion of pipeline exposed. ONGC to consider flushing the pipeline with inhibited water (suitably treated or injection with inhibitors)

Reclamation Measures;

The following management strategies may be adopted as reclamation measure for improving the soil fertility in the affected sites

- Lesser porosity may be improved by providing adequate drainage facilities, in-situ growing and incorporation of green manures crops besides adding available organic manures in the farm.
- Application of gypsum based on gypsum requirement may be followed to reduce the alkalinity.

- Leaching of salts with sufficient quantity of water and providing adequate drainage facilities to reduce the salinity and to increase the oxygen supply.
- For reducing the acidity observed in the lower depths of site, lime application may be advocated to increase the pH so as to improve the nutrient availability.
- For addressing reduced nutrient availability and microbial load, soil test based balanced fertilization and organic manure addition may be followed.

In general, reduced porosity, higher salinity, alkalinity and acidity are the common soil constraints observed hence the above suggested management strategies may be adopted to avoid the deterioration of soil fertility in a long run.



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District Environmental Engineer
Tamil Nadu Pollution Control Board
Nagapattinam

திருவாரூர் மாவட்ட வருவாய் அலுவலர் அவர்களின் செயல்முறைகள்
முன்னிலை : திரு.க.சக்திமணி, எம்.ஏ.,

ப.மு.11348/2017/ஊ4

நாள் .04.2018

பொருள்:

நிலம் - திருவாரூர் மாவட்டம் - ஓ.என்.ஜி.சி நிறுவன பயன்பாட்டிற்கு எடுத்துக் கொண்ட தனியார் நிலங்களுக்கு ஆண்டு பயிர் இழப்பீட்டுத் தொகை மேலும் முன்றாண்டுகளுக்கு (01.01.2018 முதல் 31.12.2020 முடிய) நிர்ணயம் செய்து ஆணையிடல் தொடர்பாக.

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2. இணை இயக்குநர், வேளாண்மைத் துறை, திருவாரூர். கடித எண்.ஊ2/662/2014, நாள்:29.01.2018.
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4. திருவாரூர் மாவட்ட வருவாய் அலுவலர் தலைமையில் நடைபெற்ற பேச்சுவார்த்தை உடன்படிக்கை கூட்டம் நாள் 12.04.2018

ஆணை :

திருவாரூர் மாவட்டத்தில் தனியார் நிலங்களை ஓ.என்.ஜி.சி பயன்பாட்டிற்காக எடுத்துக் கொண்ட நிலங்களுக்கு நில எடுப்புச் சட்டம் 1894 பிரிவு 35 முதல் 37- ன் கீழ் கண்டுள்ள அறிவுரைகளுக்கு இணங்க 01.01.2018 முதல் 31.12.2020 வரையிலான காலத்திற்கு ஓ.என்.ஜி.சி பயன்பாட்டில் இருக்கும் நிலங்களுக்கு இழப்பீட்டுத் தொகை நிர்ணயம் செய்து தரும்படி காரைக்கால் நிரவி, ஓ.என்.ஜி.சி. நிறுவன மேலாளரால் பார்வை(1) மற்றும் (3) ஆகிய கடிதங்கள் வாயிலாக கோரப்பட்டது. அதன்படி பார்வை (2)-இல் காணும் கடிதம் வாயிலாக திருவாரூர் வேளாண்மைத் துறை இணை இயக்குநரிடமிருந்து பயிர் கணக்கீட்டின் அறிக்கை பெறப்பட்டது. அதன் அடிப்படையில் ஆண்டு இழப்பீட்டு தொகை வழங்குவது தொடர்பாக ஓ.என்.ஜி.சி, வருவாய் மற்றும் வேளாண்மைத் துறை அலுவலர்கள் மற்றும் நில உடமையாளர்கள் சங்கப் பிரதிநிதிகள் ஆகியோர் அடங்கிய கலந்தாய்வுக் கூட்டம் 12.04.2018 அன்று முற்பகல் 11.00 மணிக்கு மாவட்ட ஆட்சியர் அலுவலகத்தில் மாவட்ட வருவாய் அலுவலர் அவர்களின் தலைமையில் நடைபெற்றது. இக்கூட்டத்தில் பார்வை(2)-இல் காணும் வேளாண்மைத் துறை பயிர் கணக்கீட்டின் அடிப்படையில் ஆண்டு இழப்பீட்டு தொகை நிர்ணயம் செய்யப்படுவதாகவும், திருவாரூர் மாவட்ட முழுமைக்கும் ஒரே சீராக ஓ.என்.ஜி.சி நிறுவனத்திற்கு தற்காலிகமாக உடைமை எடுக்கப்பட்ட தனியார் நிலங்களுக்கு வழங்க வேண்டிய

ஆண்டு இழப்பீட்டுத் தொகை இறுதி செய்திட கடந்த 1997 ம் ஆண்டு முதல் கடைபிடிக்கப்பட்ட வந்த நெறிமுறைகளின்படி கணக்கிடப்பட்டு வரும் விவரம், கூட்டத்தில் கலந்து கொண்ட விவசாயிகளிடம் தெரிவிக்கப்பட்டது. அதன்படி நெல் இருபோகம், உளுந்து, பயிறு, பருத்தி, கரும்பு மற்றும் வாழை ஆகியவைகள் பயிர் செய்யப்படுவதாக கருத்தில் கொண்டு, ஆண்டு இழப்பீட்டுத் தொகை கணக்கிடப்பட்டது. இக்கூட்டத்தில் கலந்து கொண்ட விவசாயிகள், இழப்பீட்டுத் தொகை கணக்கீடு செய்வதில் நெல், பருத்தி, உளுந்து, கரும்பு, வாழை ஆகிய பயிர்களுக்கு ஆண்டு ஒன்றிற்கு, ஏக்கர் ஒன்றிற்கு ரூ.1,25,000/- என கணக்கீடு இழப்பீட்டுத் தொகை நிர்ணயம் செய்து வழங்க வேண்டுமென கேட்டுக் கொண்டனர்.

ஆனால், கடந்த 20 ஆண்டுகளாக ஒ.என்.ஜி.சி நிறுவனத்திற்கு குத்தகை அடிப்படையில் நிலம் அளித்த நில உடமைதாரர்களுக்கு ஆண்டு இழப்பீட்டுத் தொகை வழங்கும் போது அவர்கள் அப்போது பயிர் செய்த நெல், கரும்பு, வாழை மற்றும் உளுந்து பயிரினை அடிப்படையாகக் கொண்டு மட்டும் இழப்பீட்டுத் தொகை கணக்கீடு செய்து இழப்பீட்டுத் தொகை நிர்ணயம் செய்யப்பட்டு வருவதாக நில உடமைதாரர்களுக்கு தெரிவிக்கப்பட்டது.

இக்கூட்டத்தில் கலந்து கொண்ட விவசாய பிரதிநிதிகளின் கோரிக்கையினை கருத்தில் கொண்டும், வருவாய்த்துறை, வேளாண்மைத் துறை மற்றும் ஒ.என்.ஜி.சி அலுவலர்கள் ஆகிய அனைவரின் ஒருமித்த ஒப்புதலின் அடிப்படையிலும், ஆண்டு இழப்பீட்டுத் தொகை நெல், பருத்தி, பயிறு, உளுந்து, கரும்பு மற்றும் வாழை ஆகியவை பயிர் செய்வதாக கணக்கீடு செய்து வேளாண்மைத் துறை பயிர் கணக்கீட்டின் அடிப்படையில் திருவாரூர் மாவட்டத்தில் ஒ.என்.ஜி.சி நிறுவனத்திற்கு தற்காலிகமாக உடமை எடுக்கப்பட்ட தனியார் நிலங்களுக்கு வழங்க வேண்டிய ஆண்டு இழப்பீட்டுத் தொகை மாவட்டம் முழுமைக்கும் ஒரே சீராக வழங்க இறுதி செய்யப்பட்டு கீழ்க்கண்டவாறு நிர்ணயம் செய்து ஆணையிடப்படுகிறது.

ஆண்டு இழப்பீட்டுத் தொகை வழங்கும் காலம்	பயிர் விவரம்	ஆண்டுக்கு ஏக்கர் ஒன்றிற்கு நிர்ணயம் செய்யப்பட்ட ஆண்டு இழப்பீட்டுத் தொகை(ரூபாயில்)
01.01.2018 முதல் 31.12.2020 முடிய	நெல், பருத்தி, உளுந்து, பயிறு, கரும்பு மற்றும் வாழை உள்ளிட்ட பண்ப்பயிர்கள் உட்பட	1,10,000/-

(ரூபாய் ஒரு லட்சத்து பத்தாயிரம் மட்டும்)

மேற்கண்டவாறு நிர்ணயம் செய்யப்பட்டுள்ள ஆண்டு இழப்பீட்டு தொகை, 01.01.2018 முதல் 31.12.2020 வரை திருவாரூர் மாவட்ட முழுமைக்கும் ஓ.என்.ஜி.சி நிறுவனத்தால் தற்காலிகமாக உடைமைப்படுத்தப்பட்ட தனியார் நிலங்களுக்கும், மேற்குறிப்பிட்ட காலத்திற்குள் தற்காலிக உடைமை எடுக்கப்படவுள்ள தனியார் நிலங்களுக்கும் பொருந்தும் என இதன் மூலம் ஆணையிடப்படுகிறது.

25/12/2018 1/6
மாவட்ட வருவாய் அலுவலர்,
திருவாரூர்.

பெறுநர்:

1. பொது மேலாளர், (மனித வளம்) எண்ணெய் மற்றும் எரிவாயுக் கழகம், நிரவி, காரைக்கால்.
2. வருவாய்க் கோட்ட அலுவலர்கள், திருவாரூர்/ மன்னார்குடி
3. இணை இயக்குநர், வேளாண்மைத்துறை, திருவாரூர்
4. வட்டாட்சியர், திருவாரூர்/ நன்னிலம்/குடவாசல்/வலங்கைமான்/
நீடாமங்கலம்/மன்னார்குடி/கூத்தாநல்லூர்/திருத்துறைப்பூண்டி
5. நில உடமையாளர்களின் பிரதிநிதிகள்.

நகல்: 4 இருப்பு கோப்பிற்கு.

Oil & Natural Gas Corporation Limited

OIL SPILLAGE COMPENSATION

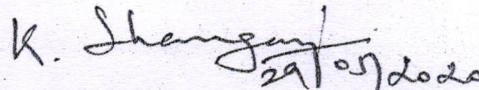
Karaikkal A+B/Chennai RO OIL LEAKAGE FROM
KMP#8-44 LINE,PERUNGUDI

Case Id: 2166

Payment ID: 18836

Name & Address of Land Owner	Contract	Rs No	Survey No	Area(In Sqm,Acr, Hcr)	Rate/ (Sqm, Acr, Hcr)	Period (Payment type)	Amount (Rs)	Remarks,if any
C.VELRAJ , , 25/2,MELATHERU,KEELAPADUGAI , PERUNGUDI,THIRUARUR TALUK , 610109	6011095	00012784	12777	400		28.04.2020 TO 28.04.2020 (LAQ Other Compensation)	10,868	
				400		Total:	10,868	


V. MOHANAKRISHNAN
 MANAGER (HR)
 ONGC, CAUVERY ASSET
 KARAİKAL-609 604,


 K. SHANMUGAIAH
 DY. GENERAL MANAGER (HR)

Oil & Natural Gas Corporation Limited

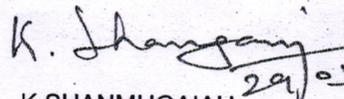
Karaikkal A+B/Chennai RO

SANCTION ORDER

KKL/CA/LAQ/OIL SPILLAGE/KMP#8 # 44/2020

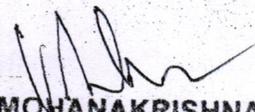
Date : 29.05.2020

In exercise of powers delegated under item No.8.10(B) of BDP -2014 sanction of the Competent Authority is hereby conveyed for an expenditure not exceeding RS. 10,868.00/- (TEN THOUSAND EIGHT HUNDRED SIXTY EIGHT Rupees only) towards payment on account of OIL LEAKAGE FROM KMP#8-44 LINE, PERUNGUDI (Damage Compensation) for the year 28.04.2020 TO 28.04.2020


29/05/2020
K SHANMUGAIAH
Deputy General Manager (HR)

COPY to:

1. MANAGER(F&A), KARAIKAL
2. MASTER FILE
3. OFFICE COPY


V. MOHANAKRISHNAN
MANAGER (HR)
ONGC, CAUVERY ASSET
KARAIKAL-609 604.

Oil & Natural Gas Corporation Limited

OIL SPILLAGE COMPENSATION FOR KMP#48

Karaikkal A+B/Chennai RO COMPENSATION
DUE TO OIL LEAKAGE AT KMP48

Case Id: 1871

Payment ID: 15172

Name & Address of Land Owner	Contract	Rs No	Survey No	Area(In Sqm,Acr, Hcr)	Rate/ (Sqm, Acr, Hcr)	Period (Payment type)	Amount (Rs)	Remarks,if any
S SELVARAJ , , 1/141, KATTAIYAN THOPPU STREET, , KAMALAPURAM POST, KOOTHANALLUR TALUK , 610102	6010619	00012175	50/2	1,850		06.04.2019 TO 06.04.2019 (LAQ Other Compensation)	50,000	
				1,850		Total:	50,000	

Suvimal
9/9/19

T.V. SUVIMAL
HR Executive

K. Shanmugiah
09/09/19

K. SHANMUGIAH
DY. GENERAL MANAGER(HR)

Oil & Natural Gas Corporation Limited

Karaikkal A+B/Chennai RO

SANCTION ORDER

KKL/CA/LAQ/OIL SPILLAGE/2019

Date : 09.09.2019

In exercise of powers delegated under item No.8.10(B) of BDP -2014 sanction of the Competent Authority is hereby conveyed for an expenditure not exceeding RS. 50,000.00/- (FIFTY THOUSAND Rupees only) towards payment on account of COMPENSATION DUE TO OIL LEAKAGE AT KMP48(Damage Compensation)for the year 06.04.2019 TO 06.04.2019

Suvimal
2/9/19

THATTUPARAMBIL VIJAYAN SUVIMAL
HR Executive

- 1 COPY to:
1. MANAGER (F&A), KARAIKAL
 2. MASTER FILE
 3. OFFICE COPY

K. Shanmugiah
09/09/19

K. SHANMUGAIAH
DY. GENERAL MANAGER(HR)