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Reviewed

Init

Stepanov

Date: *07/06/2012*

Bureau Veritas Certification
Holding SAS

VERIFICATION REPORT

OJSC "NK-ROSNEFT"

VERIFICATION OF THE ASSOCIATED GAS RECOVERY PROJECT FOR THE KOMSOMOLSKOYE OIL FIELD

REPORT No: RUSSIA-VER/0232/2012

REVISION 02

BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT

Date of first issue: 15/05/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: World Bank Carbon Finance Unit	Client ref.: Javier Coloma

Summary:
Bureau Veritas Certification has made the initial and 1st periodic verification of the “Associated Gas Recovery Project for the Komsomolskoye Oil Field” JI project of OJSC NK-Rosneft” located in Gubkinskiy city, Yamal-Nenets Autonomous Okrug, Russian Federation, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Accredited Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Corrective Action Requests (CAR), Clarification Requests (CL) and Forward Action Request (FAR) presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the ERUs issued totalize 249,467 tCO₂e for the 1st monitoring period from 1 December 2011 to 29 February 2012.

Our opinion relates to the project’s GHG emissions and resulting GHG emission reductions reported and related to the approved project baseline and monitoring, and its associated documents.

Report No.: Russia-ver/0232/2012	Subject Group: JI	
Project title: “Associated Gas Recovery Project for the Komsomolskoye Oil Field”		
Work carried out by: Leonid Yaskin – Lead Verifier		
Work reviewed by: Vladimir Lukin – Internal Reviewer		
Work approved by: Leonid Yaskin – Operational Manager		
Date of this revision: 24/05/2012	Rev. No.: 02	Number of pages: 32

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1 INTRODUCTION

The World Bank (hereafter referenced 'WB') has commissioned Bureau Veritas Certification to verify, on behalf of OJSC "NK-Rosneft", the emissions reductions of its JI project "Associated Gas Recovery Project for the Komsomolskoye Oil Field" (hereafter referenced 'the project'). The operator of the project is "RN-Purneftegaz" LLC.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Verification Team

The verification team consists of the following personnel:

Leonid Yaskin
Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

This verification report was reviewed by:

Vladimir Lukin
Bureau Veritas Certification, Internal Technical Reviewer



2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by WB and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology and/or Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, DVM Clarifications on Verification Requirements to be checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report version 1.0 dated 29/03/2012 (initial), version 2.0 dated 30/04/2012, and version 3.0 dated 14/05/2012 and version 4.0 (final) dated 24/05/2012 and the project as described in the determined PDD.

2.2 Follow-up Interviews

On 17-19/04/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of the project participant NK-Rosneft, project operator RN-Purneftegaz and project participant WB were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
NK-Rosneft RN-Purneftegaz	<ul style="list-style-type: none"> ➤ Commissioning ➤ Approval of Monitoring Report ➤ Data collection and processing ➤ Status of measuring equipment ➤ Data logs (samples) ➤ QC and QA procedures ➤ Management structure of monitoring ➤ Interviews with personnel ➤ Familiarization with project equipment in situ
WB	<ul style="list-style-type: none"> ➤ Revisions of Monitoring plan ➤ Use of calculation tool ➤ Emission calculations ➤ Monitoring Report

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

- (a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;
- (b) Clarification request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;
- (c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

The Verification Team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily



resolve the issues raised, if any, and should conclude its findings of the verification.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 3 Corrective Action Requests, 2 Clarification Requests and 1 Forward Action Request.

The number between brackets at the end of each section corresponds to the DVM paragraph.

3.1 Remaining issues and FARs from previous verifications

Not applicable since this is the initial and 1st verification.

3.2 Project approval by Parties involved (90-91)

Monitoring Report (thereafter referenced 'MR') refers to the Letters of Approvals (LoA) that have been issued by the designated focal points of the Parties involved:

- Ministry of Economic Development of the Russian Federation (Order No 326 dated 23/07/2010);
- Danish Energy Agency of the Kingdom of Denmark (LoA No 1602/1102-0063 dated 12 November 2010).

These approvals were provided to AIE which does not question their authenticity.

Outstanding issue related to Project approval by Parties involved (90-91), PP's response and the AIE conclusion are summarized in Appendix A Table 2 (please refer to CL 01).

The issued CL requests to provide in MR information about the status of the approval by another Party involved other than the Host Party.



3.3 Project implementation (92-93)

The implementation status of the project is as described in Appendix A paragraph 92.

The project has been implemented in accordance with PDD which was positively determined by the AIE (Det Norske Veritas) though did not acquire the status “deemed final” in terms of JI Guidelines paragraph 35 since the final determination report was not published on the UNFCCC JI website as Track 2 project. However, the project is published at the JI website as a Track 1 project <http://ji.unfccc.int/JIITLProject/DB/7V4PNON834FT7CVEMAC58K0Z68NSLC/details> and has the ITL number RU1000230.

The project is implemented at the Komsomolskoye oil field operated by a subsidiary company of the OJSC “NK-Rosneft” – “RN-Purneftegaz”. The purpose of the project is to recover, treat and market the produced low-pressure associated petroleum gases (APG), thereby reducing flaring of APG at the oil field and emissions of GHG to the atmosphere. The project was implemented at RN-Purneftegaz Gas Treatment and Compression Workshop #2.

The JI project activity comprises installation and/or operation of a number of facilities, including an APG buster compressor station (BCS) installed at RN-Purneftegaz Gas Treatment and Compression Workshop #2 after the existing preliminary water removal unit (PWRU), that enabling recovery, compression and treatment (dehydration) of the APG and production and transportation of (i) dry gas C1+C2 through a new pipeline for sale into Gazprom UGSS and (ii) a small fraction of liquid C3+ (hereafter denoted LPG) to the PWRU’s oil treatment unit to be added to the oil products from the Komsomolskoye field.

The MR provides information about the project facilities, plants and systems. The starting date of the monitoring period is defined as 01 December 2011. According to the PDD, the project was expected to be fully operational in the first quarter 2010. This deviation from the PDD is explained (MR page 41) by the delay in start of construction of the project and lower APG production volumes as compared to the 2008 projections used for the ex-ante estimates in the PDD.

Act of commissioning of the project BCS on 28 November 2011 is annexed to the MR.

Data in the excel model indicate that the project operated stable and permanently generated emission reductions.



It is indicated in the MR Section B.1 that during the monitoring period 406,990.653 ths m3 of raw gas were supplied to BCS from PWRU. The amount of dry gas supplied to Gazprom has been 359,791.936 ths m3 and the amount of produced LPG has been of 9,544 tons.

It is indicated in the MR Section B.1 and confirmed during the site visit that during the monitoring period 406,990.653 ths m3 of raw gas were supplied to BCS from preliminary water removal unit (PWRU); 359,791.936 ths m3 of dry gas were supplied to Gazprom.

3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)

The Monitoring System is in place and operational. Monitoring of GHG emission reductions occurred in accordance with the determined Monitoring Plan with reservations stated in 99 (a).

For calculating the emission reductions, the key factors and parameters influencing the baseline and project emissions were taken into account such as considered in the PDD sectoral reform policies and legislation, economic situation in oil & gas sector in terms of APG utilization, availability of capital (including economic barrier), APG price as well as the key data collected under monitoring as follows (refer to MR Section D.2):

- 1) Volume of APG produced at the PWRU, recovered and transferred to the BCS at point A (estimated as a Monitoring Plan revision)
- 2) Volume of dry gas (DGS) produced at the BCS and transferred to Gazprom UGSS at point BDG (measured)
- 3) Amount of LPG (NGLs) produced at the BCS and transferred to the PWRU's oil treatment unit at point BLPG (measured)
- 4) Volume of dry gas consumption for internal needs (fuel and start gas for turbine drives of compressor units, gas for flare ignition and purge gas) (measured as an extension of the Monitoring Plan)
- 5) Volume of gas flared at the high pressure and low pressure flares (measured as an extension of the Monitoring Plan)
- 6) Average carbon content of the inlet gas stream at point A (calculated by measured gas composition)
- 7) Average carbon content of dry gas sold to Gazprom UGSS at point BDG (calculated by measured gas composition)
- 8) Average density of dry gas produced at the BCS and transferred to Gazprom UGSS at point BDG (calculated by measured gas composition)
- 9) Total consumption of electricity imported from the Tyumen regional grid (measured)
- 10) Diesel fuel consumption for operation of back-up generator(s) (measured)



- 11) Net Calorific Value (NCV) of diesel fuel consumed as a result of the project activity (default value)
- 12) CO2 emission factor for diesel fuel (default value).

The data sources used for calculating emission reductions are clearly identified, reliable and transparent. They are listed and classified in the MR Sections D.1 and D.2. These include:

- measurements of parameters listed above;
- estimation of parameter 1 of the above list;
- calculation of carbon content in gas and gas density by measured gas composition;
- IPCC 2006 default data for diesel fuel;
- CDM methodology AM0009 Version 2.1 for oil and gas production operations average emission factors;
- PDD for baseline constants, electric grid emission factor and transmission and distribution losses in the grid.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenario in a transparent manner.

Calculation of emission reductions are described in the Section E and is conducted on the insert MR01 of the excel model. It is based on conservative assumptions and the most plausible scenario in a transparent manner.

The MR Version 01 introduced essential revisions in the monitoring plan such as the neglect of LPG, approximate estimation of APG volume at the BCS inlet, and neglect of emissions from flaring. However, following deliberations of these issues during the site visit, they were withdrawn from the MR.

Outstanding issues related to Compliance to the monitoring plan with the monitoring methodology (94-98), PP's response and the AIE conclusion are summarized in Appendix A Table 2 (please refer to CAR 01, CAR 02, CL 02).

The issued requests concern:

- Differences of values of baseline emissions and project emissions in the MR and excel model (CAR 01).
- Incorrect description by Formula (16) of mass balance (CAR 02).
- Clarification of parameters in MR Section D.2 (CL 02).

3.5 Revision of monitoring plan (99-100)

The MR Section B.2 identifies and justifies the intended revisions of the original monitoring plan as follows (AIE's interpretation):



- (i) Commercial metering station GMU-40 at the end of connecting pipeline to Gazprom is used for metering the amount of dry gas in the point B, as well as for measuring the electricity and diesel fuel consumption. This revision does not affect the accuracy or applicability of information collected.
- (ii) The organisation structure, the information flows and the monitoring procedures were further elaborated and improved. Refer to the MR Section C. This revision does not affect the accuracy or applicability of information collected.
- (iii) Assumptions were introduced in MR Version 1.0 as follows: the neglect of LPG, approximate estimation of APG volume at the BCS inlet, and neglect of emissions from flaring. Following discussions during the site visit, **these assumptions were withdrawn from the MR.**
- (iv) The amount of produced LPG is calculated based on measurements of LPG level in the LPG tank using gauge meter. In order to ensure conservativeness and accuracy the discount of 5% is applied to the calculated amount of LPG.
- (v) Measuring of the amount of wet gas (APG) at the BCS inlet faced with technical problems. It was replaced by using Formula (16) for calculating APG mass as the sum of measured amounts of:
 - (source 1) dry gas (DGS) produced at the BCS and transferred to Gazprom UGSS,
 - (source 2) fuel and start gas for gas turbine drives of compressor units, gas for ignition and purge gas,
 - (source 3) LPG,
 - (source 4) APG flared at high and low pressure flares at the BCS.In the absence of properly functioning APG flow meter, this approach is improving applicability of collected data.
- (vi) Monitoring of project emissions from fuel combustion was carried by estimation of carbon content in the above sources (2) and (4) by Formula (17). In the conditions when the direct monitoring of APG at the BCS inlet is not available, this formula is improving the applicability of collected data.

The AIE confirms the MR assertion that the above revisions do not influence on the final result and are applied to improve applicability of the information collected, in line with paragraphs 30 (b) and 41 of "Guidance on criteria for baseline setting and monitoring" (Version 03).

3.6 Data management (101)

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent. The evidence and records used for the monitoring are maintained in a traceable manner.



The implementation of data collection procedures is basically in accordance with the determined monitoring plan and is realized with the help of “Associated Gas Recovery Project for the Komsomolskoye Oil Field. Monitoring Manual” introduced by the Order # 2254 dated 14/10/2011 and Directive “About implementation of monitoring procedures” dated 28/10/2011 (refer to MR page 10). The above documents are at possession of the AIE. The MD Section C provides comprehensive information about the improved organisation structure, the information flows and the monitoring procedures.

RN Purneftegaz has relevant plans, procedures, schedules and responsibilities for calibration of monitoring equipment. Measuring devices have records of calibration and they are periodically exposed to due maintenance procedures. Data of the last calibration are included in the MR Section D.2. Passports of all measuring devices were made available to the AIE. The function of the monitoring equipment (flow meters, chromatograph, electrical meters, voltage and current measuring transformers) including their calibration status is in order. Information about the organisations which performed calibration of the measuring equipment and their accreditation status was provided to the AIE and caused no concern.

Automatic electronic recording of primary data on gas volumes was demonstrated to the AIE at Gas Treatment and Compression Workshop #2 where BCS is installed.

Measured and calculated data for the monitoring period are recorded in the excel Monitoring Model which was provided to the AIE.

Tabular forms in the MR Section D.2 provide information about the QA and QC procedures as well as metering equipment as on type, range of measurement, calibration frequency, last calibration date, and accuracy class.

QA and QC procedures include (quoted by the MR Section D.2):

- (i) Control of frequency of data reporting vis-à-vis the minimum frequency required by the PDD (monthly);
- (ii) Control of completeness of data records;
- (iii) Control of variances in records for the same stream beyond those expected as normal variances (to avoid substantial non-conformities and deviations).

Outstanding issues related to Data management (101), PP’s response and the AIE conclusion are summarized in Appendix A Table 2 (please refer to CAR 03, FAR 01).



The issued requests concern:

- Flaws in the excel model and the MR (CAR 03).
- Responsibilities for preparation and checking of the MR (FAR 01).

3.7 VERIFICATION REGARDING PROGRAMMES OF ACTIVITIES (102-110) – Not applicable

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the initial and 1st periodic verification of the project “Associated Gas Recovery Project for the Komsomolskoye Oil Field”. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of NK-Rosneft and RN-Purneftegaz are responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the revised project Monitoring Plan. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report Version 04 dated 24/05/2012 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or misstatements. Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:



Reporting period: From 01/12/2011 to 29/02/2012

Baseline emissions : 349,726 tCO₂ equivalents.

Project emissions : 100,259 tCO₂ equivalents.

Emission Reductions : 249,467 tCO₂ equivalents.



5 REFERENCES

Category 1 Documents:

Documents provided by the World Bank that relate directly to the GHG components of the project.

- /1/ JI Monitoring Report "Associated Gas Recovery Project for the Komsomolskoye Oil Field"
Version 1.0 dated 29/03/2012
Version 2.0 dated 30/04/2012
Version 3.0 dated 14/05/2012
Version 4.0 dated 24/05/2012
- /2/ Excel model for calculation of ER. Integral part of the Monitoring Report.
- /3/ PDD "Associated Gas Recovery Project for the Komsomolskoye Oil Field", Version 2, dated 25/07/2008.
- /4/ DNV Determination Report No 2008-0729 on JI project "Associated Gas Recovery Project for the Komsomolskoye Oil Field" dated 27/08/2008.
- /5/ The Letter of Approval issued by Ministry of Economic Development of the Russian Federation (Order No 326 dated 23/07/2010);
- /6/ The Letter of Approval issued by Danish Energy Agency of the Kingdom of Denmark (LoA No 1602/1102-0063 dated 12 November 2010).

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents obtained in the course of 1st verification

- /1/ Protocol №1 from 11.07.11 on conducting of the training on monitoring procedures in the framework of the JI project "Associated Gas Recovery Project at the Komsomolskoye Oil Field";
- /2/ Order from 14.10.11 On approval and implementation of the Standard of "RN-Purneftegaz" «Associated Gas Recovery Project at the Komsomolskoye Oil Field Project. Monitoring manual" №П1-01.05 C-0036 ЮЛ-094 version 1.00 and identification of responsible personnel»;
- /3/ Standard of "RN-Purneftegaz" «Associated Gas Recovery Project at the Komsomolskoye Oil Field Project. Monitoring manual" №П1-01.05 C-0036 ЮЛ-094 version 1.00;
- /4/ Authorization for commissioning of the constructed project installations
- /5/ Passports of quality of raw gas at BCS inlet and of dry gas supplied to Gazprom for the period 12.2011 – 02.2012;
- /6/ Certificate of calibration of chromatographs;
- /7/ Certificate of accreditation of the laboratory;



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- /8/ Certificate of calibration of gas measuring devices at measurement points GMU-4, GMU-7 and CMU-40;
- /9/ Certificate of calibration of level sensors at LPG tanks (point BLPG);
- /10/ Documents confirming accreditation of the organizations that had conducted calibration of the measurement devices:
 - FGU Tyumen Centre for Standardization and Metrology;
 - Emerson Process Management Flow B. V.;
 - FGUP VNIIM after Mendeleev»;
 - FGU Mendeleev Centre for Standardization and Metrology;
- /11/ Timelines for calibration of measurement devices;
- /12/ Training protocol #2 on monitoring procedures in the framework of the JI project “Associated Gas Recovery Project at the Komsomolskoye Oil Field”;
- /13/ Certificates of calibration of level sensors installed at LPG tanks 1, 2.

Persons interviewed:

List of persons interviewed during the verification or persons that contributed with other information that is not included in the documents listed above.

- /1/ Alexandrina Platonova – World Bank, Senior Carbon Finance Specialist
- /2/ Nikolay Eliseev – NK-Rosneft, Deputy Director of Gas Projects Department
- /3/ Evgeniy Pyatkov - NK-Rosneft, Senior Specialist of Gas and Condensate Division within Oil and Gas Production Department
- /4/ Andrey Chirikov – RN-Purneftegaz, First Deputy of General Director.
- /5/ Oleg Nuskhaev - RN-Purneftegaz, Deputy Chief Engineer, Head of Industrial and Labour Safety and Environment Protection Division
- /6/ Sergey Kislyakov - RN-Purneftegaz Deputy Head of Industrial and Labour Safety and Environment Protection Division
- /7/ Aidar Gabdulkhakov - RN-Purneftegaz, Deputy Head, Oil, Gas and Condensate Treatment and Handling Division
- /8/ Mikhail Strugatsky - RN-Purneftegaz Chief Metrologist
- /9/ Tatyana Korobova – RN-Purneftegaz, Acting Head of the Environment Protection Unit
- /10/ Maxim Vlasov - RN-Purneftegaz Head of Sector for Normative Setting and Energy Saving
- /11/ Alexander Syromolot - RN-Purneftegaz, Head of Gas Treatment and Compression Workshop (GTCW) #2
- /12/ Marina Zholudeva - RN-Purneftegaz, Chief of the Oil Quality Control Unit



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APPENDIX A: COMPANY PROJECT VERIFICATION PROTOCOL

Table 1

Check list for verification, according to the JI DETERMINATION AND VERIFICATION MANUAL (DVM) Version 01

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Project approvals by Parties involved				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	<p>Monitoring Report dated 02/04/2012 (thereafter denoted MR) refers to the Letter of Approval (LoA) that have been issued by Ministry of Economic Development of the Russian Federation, Order No 326 dated 23/07/2010. The Order is in possession of the AIE which does not question its authenticity.</p> <p>The project follows the Track 1 hence the first verification report on the project will not be sent to the secretariat for publication in accordance with paragraph 38.</p> <p>The current Russian Government Resolution # 780 of 15 September 2011 "On measures to implement article 6 of the Kyoto Protocol to the UN Framework Convention on Climate Change" does not require publishing the monitoring report and verification report somewhere.</p>		OK
91	Are all the written project approvals by Parties involved unconditional?	<p>Yes, all the written project approvals by Parties involved are unconditional and only the approval by the Host Party is granted.</p> <p>CL 01. Please provide information in the MR about the status of the approval by another Party involved other than the Host Party. According to PDD this is IBRD as the Trustee of the Danish Carbon Fund.</p>	CL 01	OK
Project implementation				



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	<p>The project has been implemented in accordance with PDD which was positively determined by the AIE (Det Norske Veritas) though did not acquire the status “deemed final” in terms of JI Guidelines paragraph 35 since the final determination report was not published on the UNFCCC JI website as Track 2 project. However, the project is published at the JI website as a Track 1 project http://ji.unfccc.int/JIITLProject/DB/7V4PNON834FT7CVEMAC58K0Z68NSLC/details and has the ITL number RU1000230.</p> <p>(i) The project is implemented at the Komsomolskoye oil field operated by a subsidiary company of the OJSC “NK-Rosneft” – “RN-Purneftegaz”. The purpose of the project is to recover, treat and market the produced low-pressure associated petroleum gas (APG), thereby reducing flaring of APG at the oil field and emissions of GHG to the atmosphere.</p> <p>(ii) The JI project activity comprises installation and/or operation of a number of facilities, including an APG booster compressor station (BCS) after the existing preliminary water removal unit (PWRU), that enable recovery, compression and treatment (dehydration) of the APG and production and transportation of (i) dry gas through a new pipeline for sale into Gazprom UGSS and (ii) a small fraction of C3+ (hereafter denoted LPG) to the PWRU’s oil treatment unit to be added to the oil products from the Komsomolskoye field.</p> <p>(iii) The MR provides information about the project facilities, plants and systems. The starting date of the monitoring period is defined as 01 December 2011. According to the PDD, the project was expected to be fully operational in the first quarter 2010. This deviation from the PDD is caused by the delay in start of construction of the project (MR Page 40) the cause of which is not explained in the MR.</p>		OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		(iv) Acts of commissioning of the project BCS and other equipment were provided to the AIE during the site visit.		
93	What is the status of operation of the project during the monitoring period?	<p>Data in the excel folder indicate that the project operated stable and permanently generated emission reductions.</p> <p>It is indicated in the MR Section B.1 that during the monitoring period 406,990.653 thousand m3 of raw gas were supplied to BCS from preliminary water removal unit (PWRU); 359,791.936 ths m3 of dry gas were supplied to Gazprom. The latter is confirmed by technical acts of gas transfer made available to the AIE during the site visit.</p>		OK
Compliance with monitoring plan				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	<p>Determination is not deemed final in JI terms since neither the final PDD nor the determination report were published on the UNFCCC JI website as Track 2 project. However, the project is published at the JI website as a Track 1 project http://ji.unfccc.int/JIITLProject/DB/7V4PNON834FT7CVEMAC58K0Z68NSLC/details and has the ITL number RU1000230.</p> <p>The Monitoring System is in place and operational. Monitoring of GHG emission reductions occurred in basic accordance with the determined Monitoring Plan with reservations stated in 99 (a).</p>		OK
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) DVM, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	<p>For calculating the emission reductions, the key factors and parameters influencing the baseline and project emissions were taken into account such as considered in the PDD sectoral reform policies and legislation, economic situation in oil & gas sector in terms of APG utilization, availability of capital (including economic barrier), APG price as well as the key data collected under monitoring as follows:</p> <p>1) Volume of APG produced at the PWRU, recovered and transferred to the BCS at point A (estimated as a Monitoring Plan</p>	CL 02	OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>revision)</p> <ol style="list-style-type: none"> 2) Volume of dry gas (DGS) produced at the BCS and transferred to Gazprom UGSS at point BDG (measured) 3) Amount of LPG (NGLs) produced at the BCS and transferred to the PWRU's oil treatment unit at point BLPG (measured) 4) Volume of dry gas consumption for internal needs (fuel and start gas for turbine drives of compressor units, gas for flare ignition and purge gas) (measured as an extension of the Monitoring Plan) 5) Volume of gas flared at the high pressure and low pressure flares (measured as an extension of the Monitoring Plan) 6) Average carbon content of the inlet gas stream at point A (calculated by measured gas composition) 7) Average carbon content of dry gas sold to Gazprom UGSS at point BDG (calculated by measured gas composition) 8) Average density of dry gas produced at the BCS and transferred to Gazprom UGSS at point BDG (calculated by measured gas composition) 9) Total consumption of electricity imported from the Tyumen regional grid (measured) 10) Diesel fuel consumption for operation of back-up generator(s) (measured) 11) Net Calorific Value (NCV) of diesel fuel consumed as a result of the project activity (default value) 12) CO2 emission factor for diesel fuel (default value). <p>CL 02. Please clarify if the value 416,127 ths m3 (BCS inlet, page 19) includes the volume of dry gas consumed by compressor units for own needs $V_{CONSUM,BCS}$ as per Formula (16) and the latter value equals 46,616 ths m3 (page 29). If so, please explain why the latter value does not equal, according to Formula (16), to the difference between 359,791 ths m3 (dry gas to Gazprom, page 21) and 416,127 ths m3.</p>		



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	<p>The data sources used for calculating emission reductions are clearly identified, reliable and transparent. They are listed and classified in the MR Section D and the insert MR01 of the excel folder.</p> <p>Relevant data sources include:</p> <ul style="list-style-type: none"> - Measurements of parameters indicated in 95 (a) above; - Assumptions made in the PDD as to the volume of APG provided to Gubkinsky GPP under the baseline and the volume of APG used to operate the BCS under the baseline; - IPCC 2006 information about leaks from the project equipment components. 		OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	<p>In accordance with the PDD, the emission factors are taken from the CDM methodology AM0009 version 2.1.</p> <p>These are:</p> <ul style="list-style-type: none"> - Emission factor of regional electric grid (1,3 tCO₂/MWh what is conservative); - Average technical transmission and distribution losses in the grid (20% what is conservative); - Oil and gas production operations average emission factors (conservative values). 		OK
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	<p>Calculations of emission reductions were implemented on the insert MR01 of the excel folder. The results are summarised in the MR Section E.</p> <p>CAR 01. Values of BL_y, $PE_{CH_4, pipeline}$, and EF_y in the table on page 40 differ from the values on the excel sheet. Please ensure consistency.</p> <p>The following assumptions were introduced in the MR Section B.2 which affect the calculation of emission reduction:</p>	CAR 01 CAR 02	OK OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>(i) Due to operational problems amount of LPG is not accounted in calculations and assumed equal zero.</p> <p>(ii) Due to technical problems, APG volume at BCS inlet $V_{A,y}$ is not measured but calculated by the approximate Formula (16).</p> <p>(iii) Emissions from flaring are neglected.</p> <p>The assumptions (i) and (ii) form the conservative model as follows. APG amount at the BCS inlet (point A) equals dry gas amount at the BCS (point B) plus dry gas consumption for project internal needs (the main source of project emissions). Due to the neglect of LPG amount, the APG amount in point A is underestimated. This results in underestimation of baseline emissions and, hence, emission reduction (Page 9).</p> <p>CAR 02. Formula (16) describes the balance of volumes though it should have dealt with a mass balance. Please correct as appropriate.</p>		
Applicable to JI SSC projects only_Paragraph 96_Not applicable				
Applicable to bundled JI SSC projects only_Paragraphs 97(a) – 98_Not applicable				
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	<p>The MR Section B.2 identifies and justifies the intended revisions of the original monitoring plan as follows (AIE’s interpretation):</p> <ol style="list-style-type: none"> 1) Commercial metering station GMU-40 at the end of connecting pipeline to Gazprom is used for metering the amount of dry gas in the point B, as well as for measuring the electricity and diesel fuel consumption. 2) The organisation structure, the information flows and the monitoring procedures were further elaborated and improved. Refer to the MR Section C. 		OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		3) Assumptions (i) – (iii) as indicated in 95 (d)) above are introduced. An appropriate justification of the monitoring plan revisions is provided in the MR Section B.2.		
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	The above revisions (1) and (2) do not affect accuracy or applicability of information collected. The use of assumptions (i) – (iii) enables to estimate a conservative value of emission reduction at the absence of measured data of APG amount in point A and LPG amount in point B thereby ensuring applicability of available measured data on dry gas amount in point B and dry gas consumption for the needs of the project activity. Conclusion is pending a response to CAR 02.	Pending	OK
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	The implementation of data collection procedures is basically in accordance with the determined monitoring plan and is realized with the help of “Associated Gas Recovery Project for the Komsomolskoye Oil Field. Monitoring Manual” introduced by the Order # 2254 dated 14/10/2011 and Directive “About implementation of monitoring procedures” dated 28/10/2011 (refer to MR page 10). The above documents are at possession of the AIE. Primary and consolidated data for the monitoring period are recorded in the excel Monitoring Model which was provided to the AIE. The folder includes inter alia data on: - daily values of raw APG at the DCS inlet (insert RF1), - values of dry gas volumes supplied to Gazprom (insert RF2), - compositions of raw APG (insert C-A) and dry gas (insert C-BDG) with intervals of a few days.	CAR 03	OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>CAR 03. Please make amendments to the excel model and MR as follows:</p> <ul style="list-style-type: none"> (i) Please correct the inadequate heading of the insert RF1 of the excel model and indicate which inserts are inapplicable to the monitoring circumstances. (ii) Please include in the excel model an insert with measured data on volume of dry gas used for own needs of compressor units. (iii) Please delete from MR Section D the data and parameters which were not used in the reported monitoring. (iv) Please correct appropriately the name “BCS Operator’ on Figures 3 and 4 and the name “Gas and Condensate Treatment Department” on page 11. <p>Tabular forms in the MR Section D.2 provide information about the QA and QC procedures as well as metering equipment as on type, range of measurement, calibration frequency, last calibration date, and accuracy class.</p> <p>QA and QC procedures include (quoted by the MR Section D):</p> <ul style="list-style-type: none"> (i) Control of frequency of data reporting vis-à-vis the minimum frequency required by the PDD (monthly); (ii) Control of completeness of data records; (iii) Control of variances in records for the same stream beyond those expected as normal variances (to avoid substantial non-conformities and deviations). <p>Evidence of calibration of the metering equipment used in the monitoring period was provided to the AIE during the site visit.</p>		
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	Judging by the provided passports of the measuring equipment with indication of calibration date the AIE concludes that function of gas		OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>meters, electrical meters, and chromatographs including their calibration status is in order.</p> <p>Information about the organisations which performed calibration of the measuring equipment and their accreditation status was provided to the AIE and caused no concern.</p>		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Evidence and records of monitoring dry gas volumes and electricity consumption are maintained in a traceable manner which was demonstrated to the AIE during the site visit.		OK
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	<p>The MR Section C provides comprehensive information about the improved organisation structure, the information flows and the monitoring procedures.</p> <p>FAR 01. Please assign responsibilities for preparation and checking of the MR.</p>	FAR 01	OK
<p>Verification regarding programs of activities (additional elements for assessment) Paragraphs 102 – 105 Not applicable</p> <p>Applicable to sample-based approach only Paragraphs 106 – 110 Not applicable</p>				



VERIFICATION REPORT

Table 2 Resolution of Requests for Corrective Actions (CAR), Clarification (CL) and Forward Action (FAR)

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>CAR 01. Values of BL_y, $PE_{CH_4, pipeline}$, and EF_y in the table on page 40 differ from the values on the excel sheet. Please ensure consistency.</p>	<p>95 (d)</p>	<p>The values of BL_y, $PE_{CH_4, pipeline}$, and EF_y are now consistent with the revised version of the Excel file <i>Monitoring report_No.1_Dec2011_Feb2012_revised_03302012.xls</i>.</p>	<p>Response is accepted. CAR is closed based on due amendment made to the MR.</p>
<p>CAR 02. Formula (16) describes the balance of volumes though it should have dealt with a mass balance. Please correct as appropriate.</p>	<p>95 (d)</p>	<p>The following modifications have been made to revised formula (16): (i) a mass balance is used; and (ii) other directly measured flows within the boundary of the BCS are taken into account to improve completeness and applicability of calculation approach used (i.e., amount of LPG produced and amount of gas flared at the high and low pressure flares).</p> <p>The full description of the revised formula 16 is provided below and in the sections B.2 and E.1 of the revised monitoring report (ver.02).</p> <p>The volume of gas produced at the oil field during the period y and supplied to the BSC is calculated as follows:</p> <p>(16)</p> $V_A = \frac{(V_{BDG,y} + V_{CONSUMBCS,y}) * \rho_{BDG,y} + V_{LPG,y} + V_{FLARES,y} * \rho_{A,y}}{w_{A,y}}$ <p>Where</p>	<p>Response is accepted. CAR is closed based on due amendment made to the MR.</p>



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification conclusion team
		<p> $V_{BDG,y}$ - Volume of dry gas (DGS) produced at the BCS and transferred to Gazprom UGSS at point B_{DG} (thousand nm³); V_{CONSUM} - Volume of dry gas consumed for own needs (fuel and start gas for turbine drives of compressor units, gas for ignition and purge gas) measured at point CMU-4 (thousand nm³); $\rho_{BDG,y}$ - Density of dry gas produced at the BCS and transferred to Gazprom UGSS at point B_{DG} (kg/nm³); $\rho_{A,y}$ - Density of APG at point A (kg/nm³); $V_{FLARES,y}$ - Volume of APG flared at high and low pressure flares at the BCS (measured at the point GMU-7, thousand nm³); $w_{A,y}$ - Average carbon content in the APG produced at point A during the period y (kgC/Nm³); $V_{LPG,y}$ - Amount of LPG produced at the BCS and transferred to the PWRU's oil treatment unit at point B_{LPG} (tons). </p> <p>All the parameters used in Formula 16 are measured at the measurement points using duly calibrated devices as described in the section D.2. In the absence of properly functioning flow meter at the point A, this approach is improving applicability of data collected compared to the original monitoring plan.</p> <p>Further, in the revised monitoring plan, the CO₂ project emissions from on-site fuel combustion, leaks, flaring and venting during transport and</p>	



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		<p>processing of recovered gas are calculated using Formula 17 based on:</p> <ul style="list-style-type: none"> • volume of gas consumed for own need (for gas turbine drives of BCS compressor units (including fuel and start gas), gas for flare ignition and purge gas) measured at point CMU-4; and • amount of gas flared at high and low pressure flares measures at point CMU-7. <p>(17)</p> $PE_{CO_2, gas, y} = V_{CONSUM_BCS, y} * w_{BDG, y} * 44/12 + V_{FLARES, y} * w_{A, y} * 44/12$ <p>Where</p> <p>$V_{CONSUM_BCS, y}$ - Volume of fuel and start gas for gas turbine drives of compressor units, gas for ignition and purge gas measured at point CMU-4 (thousand nm³);</p> <p>$V_{FLARES, y}$ - Volume of APG flared at high pressure flare ($V_{FLARE, HP, y}$) and low pressure flare ($V_{FLARE, LP, y}$) at the BCS (thousand nm³);</p> <p>$W_{BDG, y}$ - Average carbon content of dry gas used as fuel for gas turbines (measured at point B_{DG} (kgC/nm³);</p> <p>$W_{A, y}$ - Average carbon content of APG supplied to the BCS at point A (thousand nm³).</p> <p>In the context when the direct monitoring of APG volume at point A is not available, the formula 17 is improving the accuracy of calculation of $PE_{CO_2, gas, y}$ as compared to the carbon balance approach used in formula</p>	



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		<p>1 of the PDD. This approach is also improving applicability of collected data.</p> <p>It can also be demonstrated that the amount of ERs obtained through the suggested approach is more conservative than if the initial Formula 1 was used for the calculation of the $PE_{CO_2, gas, y}$. The demonstration is provided in the Excel file <i>Monitoring report No.1 Dec2011_Feb2012 crosscheck_03302012.xls</i>. The insert MR01_Rev reflects the approach used in the revised monitoring report. The insert MR01_crosscheck is using the Formula 1 from the PDD to calculate $PE_{CO_2, gas, y}$ based on carbon balance (all other remains identical to MR01_Rev). The approach used in the revised monitoring report leads to a more conservative value of ERs equal to 249,467 tCO₂e comparing with 250,239 tCO₂e.</p> <p>Figure 3 has been added to the revised report to reflect the current setting of the monitoring and measurement points.</p>	
<p>CAR 03. Please make amendments to the excel model and MR as follows:</p> <ul style="list-style-type: none"> (i) Please correct the inadequate heading of the insert RF1 of the excel model and indicate which inserts are inapplicable to the monitoring circumstances. (ii) Please include in the excel model an insert with measured data on volume of dry gas used for own needs of compressor units. 	<p>101 (a)</p>	<p>The following modification were made:</p> <ul style="list-style-type: none"> (i) The insert RF1 has been modified to reflect the fact that the amount of gas at point A is a calculated value. (ii) The following inserts have been included to fully reflect the data from measurements of all flows used in formulas 16 and 17: <ul style="list-style-type: none"> a. insert RF10: volume of fuel and start gas for gas turbine drives of compressor units; gas for ignition and purge gas measured at point CMU-4; b. insert RF13: volume of gas burned at the high pressure 	<p>Response is accepted. CAR is closed based on due amendment made to the MR.</p>



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>(iii) Please delete from MR Section D the data and parameters which were not used in the reported monitoring.</p> <p>(iv) Please correct appropriately the name "BCS Operator" on Figures 3 and 4 and the name "Gas and Condensate Treatment Department" on page 11.</p>		<p>flare measured at point CMU-7;</p> <p>c. insert RF14: volume of gas burned at the low pressure flare measured at point CMU-7.</p> <p>(iii) The section D is currently including only data and parameters used in the reported monitoring period.</p> <p>(iv) The name of BCS Operator on Figures 4, 5 & 6 were corrected to <u>Gas Treatment and Compression Workshop (GTCW) #2 Operator</u>. Relevant corrections have been included through the Section C of the revised report.</p>	
<p>CL 01. Please provide information in the MR about the status of the approval by another Party involved other than the Host Party. According to PDD this is IBRD as the Trustee of the Danish Carbon Fund.</p>	<p>91</p>	<p>The scanned copy of the letter of approval from Denmark issued on November 12, 2010 has been provided and referred to in the Section A.6 of the revised monitoring plan.</p>	<p>Response is accepted. CL is closed based on the evidence provided.</p>



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion													
<p>CL 02. Please clarify if the value 416,127 ths m3 (BCS inlet, page 19) includes the volume of dry gas consumed by compressor units for own needs $V_{CONSUM,BCS}$ as per Formula (16) and the latter value equals 46,616 ths m3 (page 29). If so, please explain why the latter value does not equal, according to Formula (16), to the difference between 359,791 ths m3 (dry gas to Gazprom, page 21) and 416,127 ths m3.</p>	<p>95 (a)</p>	<p>The amount of BCS inlet gas (raw gas) has been recalculated using a revised formula 16 through the mass balance (described above).</p> <p>The resulting value during the monitoring period is of 406,990,653 thousand m³. The formula and data used for calculation are provided in the Section E.1 of the revised monitoring report. This amount is including the following components (in mass):</p> <ul style="list-style-type: none"> $V_{CONSUM_BCS,y}$ - Dry gas consumed for own needs including fuel and start gas for turbine drives of compressor units, gas for ignition and purge gas (measured at point CMU-4); $V_{FLARES,y}$ - APG flared at high and low pressure flares at the BCS (measured at point GMU-7); $V_{LPG,y}$ - LPG produced at the BCS and transferred to the PWRU's oil treatment unit (measured at point B_{LPG}). <p>The following values have been used as referred on the insert RF1 and in the table on page 34 of the revised monitoring report:</p> <table border="1" data-bbox="862 1126 1659 1342"> <thead> <tr> <th rowspan="2">Parameter</th> <th rowspan="2">Unit</th> <th>Value</th> </tr> <tr> <th>Total/ Average</th> </tr> </thead> <tbody> <tr> <td>$V_{A,y}$</td> <td>Thousand Nm³</td> <td>406,990.653</td> </tr> <tr> <td>$w_{A,y}$</td> <td>kgC/m³</td> <td>0.5681</td> </tr> <tr> <td>$\rho_{A,y}$</td> <td>kg/nm³</td> <td>0.7638</td> </tr> </tbody> </table>	Parameter	Unit	Value	Total/ Average	$V_{A,y}$	Thousand Nm ³	406,990.653	$w_{A,y}$	kgC/m ³	0.5681	$\rho_{A,y}$	kg/nm ³	0.7638	<p>Response is accepted. CL is closed based on due amendment made to the MR.</p>
Parameter	Unit	Value														
		Total/ Average														
$V_{A,y}$	Thousand Nm ³	406,990.653														
$w_{A,y}$	kgC/m ³	0.5681														
$\rho_{A,y}$	kg/nm ³	0.7638														



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response			Verification team conclusion			
		$V_{BDG,y}$	Thousand Nm ³	359,791.936				
$\rho_{BDG,y}$	kg/nm ³	0.7414						
$w_{BDG,y}$	kgC/m ³	0.5488						
$V_{LPG,y}$	Ton	9,544.1						
$V_{CONSUM_BCS,y}$	Thousand Nm ³	46,616.772						
$V_{FLARES,y}$	Thousand Nm ³	929.145						
<p>Further, it is clarified in the revised report that the amount of $V_{CONSUM_BCS,y}$ is a directly monitored parameter (please see the description is provided in section D.2).</p> <p>Given that a more complete approach is now used for the calculation of the amount of raw gas (see revised formula 16), the difference between the amount of raw gas (calculated) and the amount of dry gas supplied to Gazprom (measured) is equal to the sum of the following components (in mass):</p> <ul style="list-style-type: none"> (i) LPG produced at the BCS and transferred to the PWRU's oil treatment unit and measured at point B_{LPG}, (ii) Dry gas consumed for own needs including fuel and start gas for turbine drives of compressor units, gas for ignition and purge gas (measured at point CMU-4); and (iii) APG flared at high and low pressure flares at the BCS (measured 								



VERIFICATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		at point GMU-7).	
<p>FAR 01. Please assign responsibilities for preparation and checking of the MR.</p>	<p>101 (d)</p>	<p>The responsibilities for preparation and checking of the MR have been clarified in the revised monitoring report in section C (pages 16-17) and relevant modifications included on revised Figure 9.</p> <p>The relevant modifications will be included into the RN-Purneftegaz standard "Associated Gas Recovery Project for the Komsomolskoye Oil Field. Monitoring Manual",</p>	<p>Response is accepted. CL is closed based on due amendment made to the MR.</p>