



Item: Memorandum of Understanding with Veolia Water North America OF1010

Initiated By: Veolia Water North America

Presented By: Jim Rearden, Director of Public Works

Action Requested: Approve Memorandum of Understanding

Suggested Motion:

1. Commissioner moves:

“I move that the City Commission (approve/not approve) the Memorandum of Understanding with Veolia Water North America and authorize the City Manager to sign the document.”

2. Mayor calls for a second, discussion, inquiries from the public, and calls the vote.

Staff Recommendation: Staff recommends that the Commission approve the Memorandum of Understanding.

Background: Amendment #5 to the current Operations and Maintenance Agreement between the City and Veolia contains Paragraph V Sharing of Cost Savings which states:

“Any savings realized from modifications or changes to the operations and maintenance of the WWTP or lift stations that are the result of actions or expenses by Veolia rather than the City shall be mutually shared between the two parties after Veolia has recovered the full cost of its investment on such modifications or changes. The actual split of the savings will be negotiated between the two parties on a project by project basis. Such savings will be calculated to reflect their current value in each ITP Year, which would receive prior approval by the City for any contemplated modifications or changes to the operations and maintenance of the WWTP or lift stations before any such work commences.”

The engine-generator set for the Co-gen system at the Wastewater Treatment Plant had a service contract with Smith Power Products of Salt Lake City (the manufacturers representative for this area) from the date it was installed continuing through the two-year warranty period. That service contract expired on March 31, 2010 and was costing \$7.12 per operating hour. The cost would have increased to \$7.80 per operating hour under Smith Power’s proposed renewal contract. Veolia, who operates the plant for the City, assumed the duties under the maintenance

contract, but believes these duties are eligible for sharing of cost savings per the above contract clause.

After discussing the issue with City Staff and after demonstrating a year's worth of cost savings, Veolia approached the City to negotiate a share of the savings per the above contract clause. The proposed share of the savings is \$2.80 per operating hour. This amount represents the overhead and profit Veolia would otherwise be paid if they would have renewed the contract with Smith Power (minus a small amount for supplies – and mark-up on those supplies – that would otherwise have been provided under the terms of the Smith Power contract). The hourly share would be adjusted each year in proportion to the change in the Consumer's Price Index in the same manner as the other costs in the Operations and Maintenance contract with Veolia. The terms of the MOU are retroactive to 4/1/2010, when Veolia assumed the duties. The total savings realized by the City as a result of Veolia assuming these duties were \$44,250 for the first full year. Under the proposed MOU, Veolia's share of the savings for the first year is \$15,883. The terms of the Memorandum of Understanding expire with the Operation and Maintenance contract on March 31, 2015 and would not be automatically renewed if the contract were extended.

Concurrences: Public Works staff agrees that Veolia should be incentivized to seek opportunities for operational cost savings. This concept is consistent with the Operation and Maintenance contract requirements. Without the proposed MOU, Veolia would have strong financial incentive to renew the Smith Power contract. The proposed MOU results in a significant savings to the City and prevents the loss in revenue to Veolia.

Fiscal Impact: Results in an overall savings for the City. For the year ending May 31, 2012 the annual net savings from operating the Co-Gen system was approximately \$114,000 (this amount would be reduced by the share of savings paid to Veolia under the terms of the MOU).

Alternatives: The Commission could choose to reject the Memorandum of Understanding. It is unknown whether Veolia would choose to reinstate the service contract should this happen.

Attachments/Exhibits: Memorandum of Understanding

Memorandum of Understanding
Maintenance of GE Jenbacher Engine/Generator

This Memorandum of Understanding ("MOU") is made and entered into this ____ day of _____, 2012, by and between the City of Great Falls, Montana ("City") and Veolia Water North America – West, LLC ("Veolia").

WHEREAS, Amendment #5 to the Operations and Maintenance Agreement between the City and Veolia contains Paragraph V Sharing of Cost Savings which states:

Any savings realized from modifications or changes to the operations and maintenance of the WWTP or lift stations that are the result of actions or expenses by Veolia rather than the City shall be mutually shared between the two parties after Veolia has recovered the full cost of its investment on such modifications or changes. The actual split of the savings will be negotiated between the two parties on a project by project basis. Such savings will be calculated to reflect their current value in each ITP Year, which would receive prior approval by the City for any contemplated modifications or changes to the operations and maintenance of the WWTP or lift stations before any such work commences.

and;

WHEREAS, Veolia has accepted responsibility for the maintenance of the GE Jenbacher Engine/Generator that was formerly performed under a Service Contract with Smith Power Products, Inc ("Smith"), and;

WHEREAS, The maintenance tasks under the Smith contract consisted solely of maintenance that was performed each 2000 operating hours as recommended by the Manufacturer's maintenance schedule, and;

WHEREAS, having Veolia perform this maintenance instead of Smith will result in significant savings to the City.

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Purpose. The purpose of this MOU is to implement Section V of the contract by defining the method and amounts in which the savings will be split between the parties.
2. Calculation of payment amount.
 - 2.1. For the Contract year beginning 4/1/2010, Veolia shall be paid \$2.80 per hour for each of the 5,672.5 hours that the subject engine-generator operated during that contract year. The total amount of the payment will therefore be \$15,883.00.

- 2.2. For each subsequent contract year the amount per hour paid Veolia shall increase by the CPI-U as defined in Article XIII of Contract Amendment #5. The number of hours shall be determined by the hour meter incorporated into the engine-generator controls. Should this reading be corrupted or determined to be inaccurate in any way, an alternative method of obtaining or estimating the operating hours may be used.
 - 2.3. The amount calculated under this clause shall constitute the full payment and will not be subject to overhead or profit calculations.
3. Payments.
 - 3.1. For the Contract year beginning 4/1/2010, the City shall pay Veolia a retroactive lump sum amount of \$15,883.00, due within 30 days of the date of this MOU.
 - 3.2. For the Contract year beginning 4/1/2011, the City shall pay Veolia a retroactive \$1,319.42 for each month that has passed between the beginning of the Contract year and the date of this agreement. Invoices for the remainder of the contract year shall include an item labeled "Co-Gen MOU" in the amount of \$1,319.42.
 - 3.3. For subsequent Contract years, the monthly invoice shall include an item labeled "Co-Gen MOU" in the amount of the previous year's annual calculated payment due (in accordance with Section 2 above) divided by 12.
 4. End of year reconciliation. At the conclusion of each contract year, in conjunction with the Incentive Target Price reconciliation, a total amount due Veolia shall be calculated in accordance with Section 2 above and the difference between that value and the amount paid to Veolia for the item "Co-Gen MOU" for that Contract year either refunded in full to the City or paid in full to Veolia, as appropriate.
 5. Scope of Duties.
 - 5.1. This MOU is based on the requirement that Veolia continue to provide preventative maintenance services, the same or similar to those provided under the Smith contract, at a level acceptable to the City using Veolia personnel. Preventative maintenance duties shall be based on G.E. Jenbacher's Maintenance Schedule titled "J312-320 A" (Exhibit A). The maintenance duties covered under this MOU are those that recur every 2000 operating hours. Maintenance duties that occur at intervals greater than 2000 hours, or any maintenance duties that are not described by the attached maintenance schedule, will be performed under the terms of the Operating and Maintenance agreement between the City and Veolia including, but not limited to, Contract Amendment #6.
 - 5.2. Appropriate deviations to the schedule may be made with concurrence of the City and without altering the payments made under the terms of this MOU. Exhibit B (attached) includes examples of acceptable deviations to G.E. Jenbacher's Maintenance Schedule.


6. Termination.

- 6.1. The conditions of the Memorandum of Agreement will expire on March 31, 2015. The terms of this Memorandum of Agreement will not be automatically renewed with any subsequent agreement or any extension of the terms of the existing Operations and Maintenance contract unless expressly specified in that agreement or extension or other mechanism.
- 6.2. Failure of Veolia to perform an acceptable level of maintenance, described in section 5 "Scope of Duties" above, to the subject equipment shall result in termination of this MOU.

The City and Veolia agree this MOU is an interpretation of the terms of the Operations and Maintenance contract as it exists on the date of this MOU and that the terms of this MOU do not alter the contract in any way. Any conflict between the terms of this MOU and the Operations and Maintenance contract will be resolved in favor of the terms of the Operations and Maintenance contract.

Dated this 12th day of April, 2012

VEOLIA WATER NORTH AMERICA – WEST, LLC

By: 

Name: Owen Boe

Title: VP Operations

Date: 04/12/12

(SEAL & ATTEST)

City of Great Falls
(Owner)

By _____
Greg Doyon

City Manager

(Title)

By _____
Lisa Kunz

City Clerk

(Title)

APPROVED FOR LEGAL CONTENT:

By _____
James W. Santoro

City Attorney

(Title)

Exhibit A – G.E. Jenbacher Maintenance schedule J312-320 A



Intervals independent of the number of operating hours			
Inspection task	Number/ section	Interval	Note
Daily inspection round	I 9002 0	daily	Carry out daily visual inspection of the unit.
Operating data log	---	daily	Log the operating data daily.
Intake air filter-Container	IW 8040 A0	daily	If the manometer at the pocket filter shows negative pressure > 4 mbar (400 Pa), the filter needs to be cleaned.
Intake air filter-Engine	IW 8041 A0	daily	If the underpressure increases to more than 1,000 Pa, the filter elements in the pre-filter and pocket filter should be replaced (or else replace them after 2,000 operating hours at the latest).
Overvoltage suppressor	IW 8048A0	daily	Visual inspection of the overvoltage deflectors.
Check ignition voltage/ spark plug	IW 0309 M0 TA1400-0104	weekly < 250 oh	The result of the ignition voltage check to be carried out weekly, serves as the indicator for the actual service life of the spark plug.
Lubricating oil	IW 0101 M0 TA 1000-0099A TA 1000-0099B TA 1000-0099C	first time after 150 oh	The results from the engine lubricating oil analyses are decisive for the actual oil change periods.
Battery	TA 1000-0050	once in a month	Check the acid level. Check if the pole binders are properly secured.
Air filter in switch cabinet	---	once in a month	Check air filter for pollution. If necessary, clean or replace.
Switch cabinet cooler	---	once in a year	Check switch cabinet cooler for clogging and, if necessary, clean using compressed air.
Smoke warning unit and gas warning unit	---	once a year or in accordance with official regulations	Check (observe the official regulations)..
Heat exchanger exhaust gas / water	I 0103 0	2,000 oh Heat exchangers >100°C water temp. → in acc. with official regulations	Heat exchangers with a water temperature >100°C are classified as installations requiring special supervision. Before commissioning - and subsequently at regular intervals - these installations are legally subjected to inspections by certified inspection agencies (e.g. operational safety regulations, steam boiler regulations, etc.).
Cooling water	TA 1000-0200 TA 1000-0201 TA 1000-0204	once in a year	Concentration inspection
	W 8080 A0	30,000 oh after having completed the overhaul activities	Cooling water exchange

Tip: The maintenance operations highlighted in green in the maintenance plan are plant-specific and are incorporated into the customer-specific maintenance plan according to engine type and version.



Betriebsstundenunabhängige Intervalle			
Inspektionsarbeit	Nummer/ Abschnitt	Intervall	Bemerkung
Condensate removal in fuel-gas system (if part of GE Jenbacher's scope of supply)	IW 8090 A0	2,000 oh at least 4 times a year	check for gas leaks
Automatic condensate removal			
Manual condensate drains		if required	condensate drain
All pipes and components carrying fuel gas and mixtures	IW 8049 0	2,000 oh at least once a quarter	Leak test
		8,000 oh at least once a year for natural gas only	
Compressed air starter	W 8032 M0	30,000 oh or once every 4 years	Overhaul
Main crankshaft bearings	W 8050 M0	30,000 oh or max. 4,000 engine starts	at 30,000 operating hours or 4,000 engine starts maximum - replace
Activated carbon adsorber unit	W 8074 A0	-	The overriding factor for the actual active-carbon interchange intervals are the results of the active carbon mass increase measurements.
Battery in DIANE module	---	every two years	Replace
Storage battery at battery charger	---	every five years	Replace
Emission measurement	---	Emission measurement according to official guidelines. Comment: If the emission levels listed in the specification are exceeded, inspect and, if required, clean the combustion chambers (W 8056 M0).	



Proper maintenance according to the maintenance schedule is a condition for honouring any claims under warranty.

The risk assessment to be performed by the plant operator and the official and quasi-official safety rules and laws may give rise to acceptance tests, inspections and maintenance operations which are not included in the Maintenance Plan. It is the operator's responsibility to implement and enforce these additional measures.

The maintenance intervals have been determined on the basis of experience of maintaining average operating levels while fully complying with the manufacturer's operating and maintenance instructions. In individual cases, the operating conditions and other factors relating to wear may affect the actual amount of maintenance required. The manufacturer therefore reserves the right to specify different maintenance intervals where appropriate.



After the „Overhaul“ 60,000 operating hours, the maintenance work to be carried out is repeated at the same interval periods.



Interval ref. nr.	Maintenance task/ Inspection task	Number	Operating hours																				
			ZK = on the occasion of cylinderhead disassembly																				
			< 100	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000
-	Maintenance after first start-up	W 1000 0	<input checked="" type="checkbox"/>																				
2	Valve clearance	W 0400 M0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Ignition system	W 0303 M0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Inspection	I 0103 0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Table cooler	W 8065 A0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Intake air filter-Engine	IW 8041 A0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Turbocharger (PBST NR)	W 8025 M0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2/8	Leak test	IW 8049 0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2/40	Crankcase vent	W 0508 M0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2/30	Regulating rods/Throttle valve/ Actuator	W 0200 M0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2/30/ 60	Gas train	W 8045 A0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Turbocharger (ABB – RR 131_151)	W 8023 M0									<input type="checkbox"/>											<input type="checkbox"/>	
10	Turbocharger (KBB – HPR 4000)	W 8024 M0									<input type="checkbox"/>											<input type="checkbox"/>	
10	Engine cooling water pump (J312/316)	W 0201 M3									<input type="checkbox"/>											<input type="checkbox"/>	
10	Engine cooling water pump (J320)	W 0202 M3									<input type="checkbox"/>											<input type="checkbox"/>	
10	Starter	W 8032 M0									<input type="checkbox"/>											<input type="checkbox"/>	
10/20/ 30	Gas mixer	W 0704 M0									<input type="checkbox"/>											<input type="checkbox"/>	
20	Mixture bypass valve	W 0802 M0																				<input type="checkbox"/>	
20	Torsion vibration damper	W 0601 M0																				<input type="checkbox"/>	
20	GE Jenbacher-switch cabinets	W 8031 A0																				<input type="checkbox"/>	
30	Piston/Piston cooling	W 8047 M0																					
30	Con rod/Con rod bearing	W 8048 M0																					
30	Cylinder liner/Scrapper ring	W 8049 M0																					
30	Crankshaft main bearing	W 8050 M0																					
ZK 30	Camshaft/Steering parts	W 8052 M0																					
60	Engine oil pump	W 8046 M0																					
60	Turbocharger after-lubrication pump	W 8054 M0																					
60	Plate-type heat exchanger	W 8043 A0																					
60	Overhaul	W 2100 M0																					
ZK	Exhaust gas manifold/Isolation	W 8051 M0																					
-	Generator (Stamford 5, 6, 7)	W 8030 A0				<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>					<input type="checkbox"/>	
-	Elastomer parts	W 8033 0									<input type="checkbox"/>											<input type="checkbox"/>	
-	Cylinder head replacement	W 8053 M0	if required																				



Please note that properly carried out maintenance work is to be acknowledged by filling in the maintenance protocol.



Interval ref. nr	Maintenance task/ Inspection task	Nummer	Betriebsstunden																		
			ZK = on the occasion of cylinderhead disassembly																		
			21000	22000	23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000
2	Valve clearance	W 0400 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Ignition system	W 0303 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Inspection	I 0103 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Table cooler	W 8065 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Intake air filter-Engine	IW 8041 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Turbocharger (PBST...NR)	W 8025 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/8	Leak test	IW 8049 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/40	Crankcase vent	W 0508 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/30	Regulating rods/Throttle valve/ Actuator	W 0200 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/30/ 60	Gas train	W 8045 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Turbocharger (ABB – RR 131 151)	W 8023 M0								<input type="checkbox"/>											<input type="checkbox"/>
10	Turbocharger (KBB – HPR 4000)	W 8024 M0								<input type="checkbox"/>											<input type="checkbox"/>
10	Engine cooling water pump (J312/316)	W 0201 M3								<input type="checkbox"/>											<input type="checkbox"/>
10	Engine cooling water pump (J320)	W 0202 M3								<input type="checkbox"/>											<input type="checkbox"/>
10	Starter	W 8032 M0								<input type="checkbox"/>											<input type="checkbox"/>
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20	Mixture bypass valve	W 0802 M0																			<input type="checkbox"/>
20	Torsion vibration damper	W 0601 M0																			<input type="checkbox"/>
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30	Piston/Piston cooling	W 8047 M0								<input type="checkbox"/>											
30	Con rod/Con rod bearing	W 8048 M0								<input type="checkbox"/>											
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30	Crankshaft main bearing	W 8050 M0								<input type="checkbox"/>											
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60	Plate-type heat exchanger	W 8043 A0																			
60	Overhaul	W 2100 M0																			
ZK	Exhaust gas manifold/Isolation	W 8051 M0																			
-	Generator (Stamford 5, 6, 7)	W 8030 A0			<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>						<input type="checkbox"/>
-	Elastomer parts	W 8033 0								<input type="checkbox"/>											<input type="checkbox"/>
-	Cylinder head replacement	W 8053 M0	if required																		



Please note that properly carried out maintenance work is to be acknowledged by filling in the maintenance protocol.



Interval ref. nr	Maintenance task/ Inspection task	Nummer	Betriebsstunden																		
			ZK = on the occasion of cylinderhead disassembly																		
			41000	42000	43000	44000	45000	46000	47000	48000	49000	50000	51000	52000	53000	54000	55000	56000	57000	58000	59000
2	Valve clearance	W 0400 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Ignition system	W 0303 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Inspection	I 0103 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Table cooler	W 8065 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Intake air filter-Engine	IW 8041 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Turbocharger (PBST... NR)	W 8025 M0																			
2/8	Leak test	IW 8049 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/40	Crankcase vent	W 0508 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/30	Regulating rods/Throttle valve/ Actuator	W 0200 M0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2/30/ 60	Gas train	W 8045 A0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Turbocharger (ABB – RR 131 151)	W 8023 M0								<input type="checkbox"/>											<input type="checkbox"/>
10	Turbocharger (KBB – HPR 4000)	W 8024 M0								<input type="checkbox"/>											<input type="checkbox"/>
10	Engine cooling water pump (J312/316)	W 0201 M3								<input type="checkbox"/>											<input type="checkbox"/>
10	Engine cooling water pump (J320)	W 0202 M3								<input type="checkbox"/>											<input type="checkbox"/>
10	Starter	W 8032 M0								<input type="checkbox"/>											<input type="checkbox"/>
10/20/ 30	Gas mixer	W 0704 M0								<input type="checkbox"/>											<input type="checkbox"/>
20	Mixture bypass valve	W 0802 M0																			<input type="checkbox"/>
20	Torsion vibration damper	W 0601 M0																			<input type="checkbox"/>
20	GE Jenbacher-switch cabinets	W 8031 A0																			<input type="checkbox"/>
30	Piston/Piston cooling	W 8047 M0																			<input type="checkbox"/>
30	Con rod/Con rod bearing	W 8048 M0																			<input type="checkbox"/>
30	Cylinder liner/Scraper ring	W 8049 M0																			<input type="checkbox"/>
30	Crankshaft main bearing	W 8050 M0																			<input type="checkbox"/>
ZK 30	Camshaft/Steering parts	W 8052 M0																			<input type="checkbox"/>
60	Engine oil pump	W 8046 M0																			<input type="checkbox"/>
60	Turbocharger after-lubrication pump	W 8054 M0																			<input type="checkbox"/>
60	Plate-type heat exchanger	W 8043 A0																			<input type="checkbox"/>
60	Overhaul	W 2100 M0																			<input type="checkbox"/>
ZK	Exhaust gas manifold/Isolation	W 8051 M0																			<input type="checkbox"/>
-	Generator (Stamford 5, 6, 7)	W 8030 A0			<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>							<input type="checkbox"/>
-	Elastomer parts	W 8033 0								<input type="checkbox"/>											<input type="checkbox"/>
-	Cylinder head replacement	W 8053 M0	if required																		



Please note that properly carried out maintenance work is to be acknowledged by filling in the maintenance protocol.

Exhibit B – Acceptable alterations to the G.E. Jenbacher Maintenance schedule J312-320 A

Periodic Maintenance Schedule for Cogeneration Unit (Note: This list includes items that are beyond the scope of the Smith contract and therefore not part of the MOU).

Adapt Biogas Engine Maintenance Schedule as sent from Smith Power Products with the following exceptions

- Run to failure the engine starter and water pump in lieu of overhaul. Both units were replaced at the 10000 hour maintenance task by Smith Power technicians.
- Replace the engine-generator coupling when the Generator Bearings are replaced or when evidence of coupler degradation occurs.
- Run to failure the bypass mixer valve in lieu of replacement.
- Run to failure the turbocharger in lieu of replacement. Inspect axial and radial play per inspection procedure every 2000 hours.
- Allow the torsion vibration damper to be used until oil leakage is evident.
- Ignore tasks for the GE Jenbacher-switch cabinets and the Gas Mixer inspection as these tasks are not applicable to this installation.
- Perform generator bearing vibration testing every 2000 hours to determine when bearings need to be replaced, continue with 4000 hour lubrication requirements.
- Replace elastomer parts when failures/leaks start to occur.
- Have an oil analysis performed to provide a base line for future determination for engine wear.

Add the following checks to the current 2000 hour maintenance checks:

- Turbocharger axial and radial play inspection.
- Generator bearing vibration testing.
- Engine coolant pH testing.
- Engine-generator coupling check for evidence of coupler degradation.
- Torsion vibration damper check for oil leakage.