## **ATTACHMENT A - Model Shale Gas Production Sharing Contract**

Following are suggested terms for a model shale gas PSC, with notes and analysis.<sup>1</sup>

PSC Article (in Order of Layout)	Sub-section (by Topic)	Suggested Model Shale Gas PSC (PSC)	Notes
Definitions	Shale Gas, Other Hydrocarbons	"Shale Gas means an accumulation of natural gas in the form of absorbed gas, free gas and dissolved gas, which is stored in organic substance rich shale layer(s); Shale Gas belongs to unconventional nature gas, and can become commercial gas stream through hydraulic fracturing."  Separate definition for Other Hydrocarbons including conventional oil and gas, and liquid hydrocarbons extracted from shale layers.	Definition of Shale Gas follows the definition in Shale Gas Resource/Reserve Calculation and Evaluation Technical Standard (DZ/T 0254-2014).  Hydrocarbons beyond Shale Gas, including conventional oil, gas, and liquid hydrocarbons from shale layers are defined as Other Hydrocarbons.
	Gas Field	An accumulation of Shale Gas in the Contract Area which has commercial value and development plans.	This provision is similar to the onshore CBM PSC.  Based on the definition of Shale Gas, the accumulation of shale gas is limited to the layer(s) of certain depths.

<sup>&</sup>lt;sup>1</sup> This model PSC draws on the material in *Model Production Sharing Contract for Foreign Cooperation in Shale Gas Exploration, Appraisal, Development and Production in China* (ConocoPhillips China Inc., January 16 2012) and *2014 Model Unconventional Resources Operating Agreement* (June 2014 AIPN Model Contracts Workshop).

Petroleum Operations, Exploration Operations, Appraisal Operations, Development Operations, Pilot Project	Petroleum Operations include Exploration (incl. appraisal), Development and Production Operations.  Defined by time – Development starts when ODP is approved, Production starts from Commencement of Commercial Production.  Additionally, Exploration Operations includes Pilot Project (incl. production therefrom) and execution of long term gas sales and transportation contracts.  "Pilot Project means the set of operations, activities, wells and facilities needed to evaluate the shale gas exploitation methodologies to be used to exploit specified Sub-Area(s) in a Shale Gas resource in order to determine the commercial viability of a large scale exploitation of Shale Gas."	This provision is similar to the onshore CBM PSC.  In addition, Pilot Project is added under Exploration Operations to determine the commercial viability of the exploitation of Shale Gas in a large scale.
Exploratory Well, Appraisal Well, Development Well	Development Well is any well drilled in Development or Production Area after ODP approval for the purpose of producing or increasing/accelerating the production of Petroleum.	This provision is similar to the onshore CBM PSC.  There is not concept of Exploratory Well or Appraisal Well (Pilot Project includes wells drilling).
Development Area, Production Area, Sub-Area	Sub-Area, as determined by the JMC, is a portion of the Contract Area with Shale Gas prospects for the Pilot Project.	This provision is similar to the onshore CBM PSC.  There is concept of Exploration Area.

	Development Area is a portion of the Contract Area designated for development plus potential contiguous extension areas, which is identified in the ODP and approved.  Production Area is within the Development Area and designated for Production Operations – need NOC approval.	The concept of Sub-Area is added.
Date of Commencement of Commercial Production	Date proposed and announced by the JMC.	This provision follows that onshore CBM PSC. The provision does not mention completion of Development Operations or government approval.
Overall Development Plan (ODP)	The ODP must be reviewed and adopted by the JMC, confirmed by the NOC and approved by the government; it must include recoverable reserves, designs, production profile, economic analysis and time schedule of Development Operations.  Development plan can be compiled for the Sub-Area in case of phased development.	This provision follows the onshore CBM PSC.  The onshore CBM PSC includes the concept of a development plan for "part of a CBM field" in case of phased development.  Similarly, the provision clarifies that an ODP can be submitted for a Sub-Area, and the Contract Area contains different Sub-Areas covered by different ODPs.
Deemed Interest	Interest on development costs when such costs are recovered by the Parties (i% per annum).	This provision is similar to the onshore CBM PSC.
Delivery Point	Shale Gas's Delivery Point shall be the most economically viable nearby pipeline having available capacity.	This provision follows the onshore CBM PSC.

Objective of the Contract		Explore, develop and produce Shale Gas in the Contract Area.  Contractor to apply advanced technology, and transfer technology to Chinese personnel and train them.	This provision follows the onshore CBM PSC.
Other Discoveries		In case that the IOC has discoveries of Other Hydrocarbons other than Shale gas during its implementation of the PSC, NOC shall negotiate with IOC, at IOC's request, regarding IOC's participation in the exploitation of Other Hydrocarbons.	This provision is newly added.  The IOC may discover other petroleum resources, such as conventional oil, gas or other liquid hydrocarbons, during its implementation of the PSC. Since the IOC made such discovery, it is reasonable that a
Contract Area		Surface area defined by geographic coordinates.	Shale gas PSC gives the IOC an opportunity to participate in the exploitation of other petroleum resources, maybe with lower participation interests.  This provision follows the onshore CBM PSC.
Contract Term	Exploration Period, Development Period and Production Period	"Exploration Period" begins when the PSC is implemented and ends when the ODP is approved, and shall be 20 to 24 months unless otherwise agreed.  Development Period begins when the ODP is approved and ends when Development Operations is completed in accordance with the ODP, but may continue while the production period begins.	Each Sub-Area may be in its own development and production period, and two periods may co-exist within the Contract Area.  The Development Period of one Sub-Area begins, while, Exploration of another Sub-Area may continue.
		Production Period begins on Declaration of Commencement of Commercial Production and ends on the date specified in the ODP, but	

		shall not exceed 30 yrs.by the parties.  Each Sub-Area may be in its own development and production period. The Development Period of one Sub-Area begins, while, Exploration of another Sub-Area may continue.	
	Extensions of Production Period	Possible with approval of Chinese govt. in certain circumstances.	This provision follows the offshore PSC and the onshore CBM PSC.
	Abandonment of Field	Either Party may propose to abandon production from any Field.  If the Parties mutually agree to abandon a Field, the abandonment cost is shared.  If only the Contractor elects to abandon a Field, all of its rights and obligations related to that field are terminated.  Mechanism laid out under Relinquishment section (since there is no relinquishment obligation by Contractor).	This provision follows the offshore PSC and onshore CBM PSC.
	Term	30 years with extension at Contractor's request.	This provision follows the offshore PSC and onshore CBM PSC.
Relinquishment	Relinquishment Commitment	Contractor has no relinquishment obligation, only the right to abandon a portion of the Contract Area.	This provision follows the onshore CBM PSC.

	Fee for Exploration or Mining Rights	In the Exploration Period, Contractor shall bear the fee for Shale Gas's exploration right required by law.	This provision follows the onshore CBM PSC.
		In the development or production periods, the fee for mining rights shall be shared by the parties.	
		But the above is not linked to relinquishment.	
Minimum		Contractor to fulfill work commitment in	This provision follows the onshore CBM PSC.
Exploration		Exploration Period, incl. Pilot Project, gas in	
Commitment		place, EIA, ODP, gas sales contracts, project	
and		financing.	
Expenditures		No minimum spend specified and no penalty if Contractor does not fulfill commitment.	
Management	Joint Management	NOC and Contractor to each appoint equal	This provision follows the offshore PSC and
Organization	Committee (JMC)	number of members (1-3) on JMC.	onshore CBM PSC.
and its Function	Members	Chairman shall be from NOC and Vice Chairman shall be from Contractor.	
	JMC's Role	Lists items to be determined and/or reviewed and/or approved by JMC.	This provision follows the onshore CBM PSC.
Operator	Designates Operator	Contractor is Operator unless transferred according with PSC provisions.	This provision follows the offshore PSC and the onshore CBM PSC.
	Operator's Role	Lists Operator's obligations.	This provision follows the onshore CBM PSC.
	Transfer of	From Cost Recovery Date, NOC and	This provision follows the onshore CBM PSC.
	Production	Contractor shall conduct Shale Gas	
	Operations	Operations within the Contract Area under a Joint Operating Agreement.	

	Land Use	Operator shall have the right to use or occupy land incl. right of way inside and outside Contract Area, in order to conduct the Work Programs.	This provision follows the onshore CBM PSC.
Assistance from NOC		NOC to provide assistance for matters related to government approvals, permits, local office, staff hire, onshore facilities and gas marketing and transportation plan.	This provision follows the onshore CBM PSC.
Work Program and Budget	Timeframe	Operator shall submit an annual Work Program and budget to the JMC for review, then NOC for approval in a fixed timeframe.	This provision follows the offshore PSC and the onshore CBM PSC.
	Expenditures Outside Budget	Sets the limits to the extent of excess spend beyond the Work Program and budget.  If JMC does not consider annual spend in excess of 5% of the budget to be reasonable, an expert group should be formed to determine whether the spend should be charged to the joint account.	This provision follows the offshore PSC and the onshore CBM PSC.
Determination of Commerciality	Timeframe	Sets timeframe for process:  - Operator's determination of "sweet spot"  - Appraisal Work Program operation and report  - JMC's Determination of "Sub-Area" which is with Shale Gas prospect after exploration;  - Pilot Project preparation and JMC approval;  - Pilot Project Work Program (which includes the conclusion of gas sales and transportation contracts) should be completed instead of an appraisal Work	This provision is adapted from the offshore PSC. Two major changes are i) this provision is made to be reoccurring for different "Sub-Areas"; and ii) the ODP is linked to a Sub-area.

	Program;  - JMC review and determination of commerciality of this Sub-Area;  - Submission and approval of the ODP for the Sub-Area;  - Start of Development Operations and production consequently;  - The same sequence repeats from another "sweet spot".	
Sole Devel	I. If Contractor does not consider the certain Sub-Area to have commercial value, the NOC may develop the field, and Contractor can later decide to participate before the DCCP if it pays its share of the development costs plus a 300% additional fee. If Contractor does not participate before the DCCP, the field will be excluded from the Contract Area – but Development and Production Operations should still be carried out by Operator.  If the NOC does not consider a Sub-Area to have commercial value, Contractor may solely develop the field at its own costs and risks, and without NOC working interest.  2. Subject to any necessary approval under the Contract and the Laws, and provided that safety and Joint Operations are not impaired, any Party may propose to expand the capacity of the existing multi-pad production	The first part under this provision is similar to the offshore PSC, but different from the onshore CBM PSC. The offshore PSC allows sole risk development, but the onshore CBM PSC does not include such concept.  In addition, expanding a multi-pad production facility at one party's sole risk is added to promote development of shale gas. However, the sole risk activities shall be approved by the JMC to avoid any disturbance to the existing operations.

		facility at its sole risk and expense. In this event, the Party shall present a proposal to the JMC for its consideration and such expansion may not take place until the JMC has granted its approval.	
	Trial Production	Trial Production is Included in the Pilot Project.	This provision follows the onshore CBM PSC.
	Other Operations in the Region	Parties shall reach agreement on development of the Contract Area in a manner that does not interfere unreasonably with the potential development of conventional petroleum resources in the Contract Area.	This provision is similar to the onshore CBM PSC.  In case that conventional resources are discovered during the exploration or development of shale gas, and the IOC and the NOC cannot reach an agreement to exploit such conventional resources together, the parties shall not interfere with each other when exploiting the Shale Gas and conventional petroleum resources in parallel.
Financing and Cost Recovery	Financing of Exploration, Development and Production Costs	Exploration costs borne by Contractor; development and production costs shared by PSC parties.	This provision follows the offshore PSC and the onshore CBM PSC.
	Cost Recovery	All operating, exploration and development costs incurred in Petroleum Operations can be recovered from Shale Gas produced and the agreed Other Hydrocarbons produced.  Cost recovery starts after the Declaration of Commencement of Commercial Production.  No interest is applied to exploration costs; a Deemed Interest is applied to development	This provision is similar to the onshore CBM PSC.  Costs can be recovered from Shale Gas produced. In addition, if there are other hydrocarbon discoveries in the Contract Area and the IOC's participation is agreed by the contracting parties, such Hydrocarbons produced can used for cost recovery.

		costs.  Costs can be recovered from the Shale Gas produced and the agreed Other Hydrocarbons produced.	
Production and Allocation	Gross Annual Production, Cost Recovery Shale Gas, Investment Recovery Shale Gas, Remainder Shale Gas, Allocable Remainder Shale Gas	Lays out the allocation of production in a fixed sequence: - VAT - Royalty - Cost recovery (by cost type and limited to 62.5% of Annual Gross Production) - Factor (X) Parties share  70% of Annual Gross Production is deemed as Cost Recovery Shale Gas and Other Hydrocarbons.	This provision follows the onshore CBM PSC.
Quality, Quantity, Price and Destination	Quality	Quality analysis shall take place at the Delivery Point (local pipeline).	This provision follows the onshore CBM PSC.
	Quantity	Quantity lifted shall be made at a delivery point and with measuring device as agreed by the parties.	This provision follows the offshore PSC and onshore CBM PSC.
	Price	Based on the actual free market price, the price will be volumetric weighted average of i) price of Contractor's and NOC's determination; and ii) the fair market price, accounting for prevailing market condition.	This provision follows the onshore CBM PSC.

		The transportation costs included in the price at Delivery Point shall be agreed to in the long-term sales agreement during the Exploration Period.  Payment in USD per cubic meter.	
	Destination	Contractor may sell a part or all of its gas and/or Other Hydrocarbons to: - jointly with the NOC to the buyers; - to Chinese buyers; - to the NOC or its affiliate (who have obligation to buy all or part of Contractor's Shale Gas/ Other Hydrocarbons if requested by Contractor); - any other lawful buyers.	This provision follows the onshore CBM PSC.
	Pipeline Access	Contractor shall be guaranteed the access and priority use of a pipeline owned by the NOC contracting party or its affiliate (provided a transportation contract is signed).  "The NOC shall use its reasonable endeavors to negotiate, or facilitate the Contractor to negotiate, with the other pipeline owners to secure pipeline access and priority use of a pipeline which is not owned by the NOC."	This provision follows the onshore CBM PSC.  In addition, obligations are added to NOC to facilitate the IOC to secure pipeline access.
Chinese Personnel, Goods and Services		Preference shall be given to employment of Chinese personnel and procuring goods and services from Chinese subcontractors (provided their conditions are competitive).  Contractor's hire of Chinese personnel shall	This provision follows the onshore CBM PSC.

		be consistent with conducting Shale Gas operations in an efficient manner and in accordance with international practices. Also all Chinese employees shall sign contracts with the Operator who has the right to dismiss them if they breach the terms.	
Training and Technology Transfer	Contractor's Commitment	Contractor shall use advanced technology during operations, train Chinese personnel (according to a training plan), and conduct scientific exchange.	This provision follows the onshore CBM PSC.  There is no minimum percentage threshold of Chinese personnel that should be maintained by the IOC.
		The advanced technology and managerial experience transferred to the NOC remains the property of the Contractor and subject to confidentiality restrictions.	
	Costs	The costs of such training or technology transfer may be charged to development costs or operating costs, depending on when they are incurred.  The costs of training or technology transfer may also be charged to exploration costs if incurred before first ODP approval.	Because there may be more than one ODP needed for Shale Gas project, "first" ODP is added to avoid the confusion if multiple ODPs will be compiled and approved.
Ownership of Asset and Data		NOC shall own all assets developed under the Work Program from the earlier occurring date of either the Contractor fully recovering its development costs or the end of the production period.	This provision follows the onshore CBM PSC.

	NOC owns any data and records obtained the course of the Petroleum Operations.  "Common Facilities" (facilities constructed for the Shale Gas Operations, whether located within or outside the Contract Area) may be used by NOC or Contractor free of charge.	
Accounting, Auditing and Personnel Costs	Operator responsible to keep accounts of costs and applicable deemed interest, and the quantity and price of crude oil and gas produced.  Non-operator parties may audit the accounts kept by the Operator in accordance with the PSC provisions.	This provision follows the offshore PSC and onshore CBM PSC.
	Salaries and staffing plan should be determined by the Operator and reviewed by JMC.	
Taxation	Contractor shall pay own taxes according to Chinese law.  Operator shall advise subcontractors (and their employees) to pay their taxes according to Chinese law.	This provision follows the offshore PSC and onshore CBM PSC.
Insurance	Operator shall prepare insurance program and, after JMC approval, obtain the insurance from a Chinese insurance company.  Specified the types of insurance which must be obtained e.g. pollution, vessels. All motor vehicles used during Shale Gas operations	This provision follows the onshore CBM PSC.

	should be insured.  Premiums may be charged to exploration,	
	development or operating costs, as applicable.	
Confidentiality	No party may disclose information designated by JMC as confidential to any third parties.  NOC may disclose such information (but not data, patents etc. owned by Contractor) to	This provision follows the offshore PSC and onshore CBM PSC.
	relevant third parties after a set timeframe.  List exceptions i.e. third parties who may receive information such as banks, subcontractors, assignees.	
Assignment	Contractor can assign its rights/obligations to its affiliate with NOC's prior consent, and Contractor's performance guarantee; or to a third party if NOC does not exercise its right of first refusal	This provision follows the onshore CBM PSC.
	NOC's consent for Contractor's assignment to its affiliate, or NOC's exercise of its ROFR must be given within 60 days of Contractor's notice.	
	NOC may authorize its subsidiary to implement the PSC; or, NOC may transfer its rights/obligations to any third party subject to govt. approval.	

Environmental Protection and Safety		Operator shall comply with all environmental protection laws of China, and cooperate with any government inspectors.  Includes additional provision that Operator shall restore the operating sites to the condition at the start of the PSC.	This provision follows the onshore CBM PSC.
Force Majeure(FM)	Definition	"(a)ny event or combination of events which could not be foreseen and/or which is beyond the control of such party including government actions."	This provision follows the offshore PSC and onshore CBM PSC.
	Application	When such an event prevents a party's performance of its PSC obligations, and the party has taken all reasonable actions to overcome the obstacle and notified the other party of FM, the party shall not be considered in default of the PSC, and the parties shall consult to find an equitable solution.  If the operation is suspended for over 30 days due to FM, the period of operations may be extended.  Includes additional provision that Contractor may terminate the PSC if the FM condition continues for 24 months.	This provision follows the onshore CBM PSC.
Consultation and Arbitration	Dispute Resolution Procedure	Friendly consultation first; then arbitration, which will be final and binding.	This provision follows the offshore PSC and CBM PSC.
	Location and Rules	Any dispute arising out of or in connection with this contract, including any question regarding its existence, validity or	The Offshore PSC and CBM PSC adopt two- step arbitration approach, i.e. if agreed by the parties, arbitration will be referred to

		termination, shall be referred to and finally	CIETAC;
		resolved by arbitration in Singapore	and, if parties cannot agree on arbitration
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		administered by the Singapore International	arrangement, ad hoc arbitration shall take
		Arbitration Centre (SIAC) in accordance with	place; the location will be agreed by the
		the Arbitration Rules of the Singapore	selected arbitrators; the Parties should set up
		International Arbitration Centre ("SIAC	ad hoc tribunal if the place of arbitration is
		Rules") for the time being in force, which	not agreed within 45 days of one party's first
		rules are deemed to be incorporated by	request for arbitration.
		reference in this clause.	
			Validity of the two-step arbitration approach
		The seat of the arbitration shall be	and ad hoc arbitration is uncertain under
		Singapore.	Chinese law, and such clauses presents a risk
			to the parties as they may be forced into a
		The Tribunal shall consist of 3 arbitrators.	Chinese court for resolution, therefore the
		,	clauses should be replaced with arbitration
		The language of the arbitration shall be	in a 3 <sup>rd</sup> country other than those of the
		Chinese and English.	Parties. Arbitration in Singapore is provided
		dimese and English	as an example.
Effectiveness,	Effective Date	The Contract shall take effect as of its	Offshore PSC and onshore CBM PSC take
· ·	3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	execution by both Parties.	effect from the date of the approval of
Termination			Ministry of Commerce.
and			Trimistry of dominier ec.
Cancellation			The effectiveness of a PSC is no longer subject
			to the approval of MOFCOM, so it takes effect
			as of its execution to mitigate uncertainty.
	Termination,	List circumstances under which the PSC	This provision follows the offshore PSC and
	Cancellation	terminates, generally due to lack of discovery	onshore CBM PSC.
	Gantenation	during exploration period, or PSC reaches the	Unshiole GDM FSG.
		end of production period, or the Maximum	
		Period has passed.	
		One party may terminate the agreement if	
		the other commits a material breach of the	

	PSC, as determined by the arbitration award.	
Applicable Law	The PSC is governed by Chinese Law.	This provision follows the offshore PSC and the onshore CBM PSC.
	Economic stabilization provision.	
Language	Chinese and English are with equal effect.	This provision follows the offshore PSC and onshore CBM PSC.
Miscellaneous	Notices; "Contractor" composition; PSC interpretation;	In general, the provision follows the onshore CBM PSC.
	No signature fee.	In addition, because the Chinese NOC enters into the PSC as a commercial entity, the
	In addition, add in a "Waiver of Sovereign Immunity":	Waiver of Sovereign Immunity is included.
	Any Party that now or later has a right to claim sovereign immunity for itself or any of	
	its assets hereby waives any such immunity to the fullest extent permitted by the laws of	
	any applicable jurisdiction. This waiver includes immunity from:	
	a. any expert determination, mediation, or arbitration proceeding commenced under	
	this Agreement;	
	b. any judicial, administrative or other proceedings to aid the expert determination,	
	mediation, or arbitration commenced under	
	this Agreement; and	
	c. any effort to confirm, enforce, or execute any decision, settlement, award, judgment,	
	service of process, execution order or	

attachment (including pre - judgment attachment) that results from an expert determination, mediation, arbitration or any judicial or administrative proceedings commenced under this Agreement.	
For the purposes of this waiver only, each Party acknowledges that its rights and obligations under this Agreement are of a commercial and not a governmental nature."	