Memorandum of Agreement between the BNL Instrumentation Division and the sPHENIX Project on the Instrumentation Division Support for the sPHENIX Upgrade

A. Purpose

The purpose of this Memorandum of Agreement (MoA) is to establish an agreement between the BNL Instrumentation Division and the sPHENIX Project concerning the support that will be provided by the BNL Instrumentation Division to the sPHENIX Project for the completion of the sPHENIX Upgrade. For the purpose of this document, the sPHENIX Upgrade is defined as the sPHENIX MIE and the sPHENIX Integration and Installation.

B. Responsibilities

The BNL Instrumentation Division will provide sufficient personnel to support at a minimum, the resources shown in Table 1 for the period of performance of the MoA in order to accomplish the tasks listed below the Table. The task descriptions are taken from the sPHENIX Resource Loaded Schedule, which also captures the labor-effort and period of performance for the planned tasks. The sPHENIX project plan includes contingency that may be accessed should tasks require more effort and/or more expensive personnel than estimated in the Resource Loaded Schedule. The funding for the labor resources assigned to work on both the MIE and Infrastructure and Facility Upgrade will receive the BNL extraordinary project rate.

Instrumentation Activity	FY18	FY19	FY20	FY21	FY22	FY23
TPC FEE	0.23	1.30	0.19	0.05	0.00	0.00
TPC DAM	0.29	0.90	0.72	0.56	0.10	0.00
GL1 Trigger	0.35	0.54	0.44	0.00	0.00	0.00
Timing System	0.49	0.47	0.37	0.00	0.00	0.00
TPC Commission	0.00	0.00	0.00	0.00	0.02	0.19
Full sPHENIX Commissioning	0.00	0.00	0.00	0.00	0.25	0.19
TOTAL FTE	1.37	3.22	1.73	0.60	0.38	0.38

Table 1: sPHENIX Project FTEs/FY by Activity.

Table Notes:

a) FY22 is a transition year spanning the end of the MIE, the final year of installation and the preparation for the start of the first sPHENIX run.

b) FTE values include multiple resource types such as Electrical Engineers, Electrical Technicians and Electrical Technician–Designers. Specific resource contributions are reflected in the sPHENIX Upgrade Resource Loaded Schedule.

The sPHENIX Upgrade responsibility assigned to the Instrumentation Division is to lead the engineering effort and provide technician support as needed, for the following:

- Design, Prototyping, Production, Testing and Acceptance of the TPC Front End Electronics
- Design, Prototyping, Firmware, Production, Testing and Acceptance of the TPC Data Aggregator Modules
- Design, Prototyping, Firmware, Production, Testing and Acceptance of the Global Level-1 Trigger
- Design, Prototyping, Firmware, Production, Testing and Acceptance of the Timing System
- Commissioning of the TPC FEE and TPC Data Aggregator Modules during installation and commissioning of the TPC after the TPC is fabricated and again when the TPC is installed during sPHENIX Integration and Installation into Bldg. 1008
- Commissioning of the Global Level-1 Trigger and of the Timing System during sPHENIX Integration and Installation into Bldg. 1008

Many activities associated with preparing sPHENIX to take data are not captured in the Resource Loaded Schedule for the sPHENIX Upgrade but nevertheless will need to be supported if sPHENIX is to obtain its Ultimate Performance Parameters and deliver on its scientific mission. The resources necessary to transition sPHENIX from its KPPs to UPPs will be captured in future documents including the Transition to Operations plan.

The activities supported by this agreement include the design, prototyping, firmware, production, testing, installation and commissioning of the aspects of the sPHENIX Upgrade and its Installation and Integration plan as noted in the above Table. The MoA covers the support that the sPHENIX Project will receive from the Instrumentation Division according to the current plan. The level of support can be increased in the out-years as budgets allow and circumstances evolve.

C. General Provisions

Modifications to this MoA

Modifications within the scope of this MoA shall be made by mutual consent of the parties and by issuance of a written modification, signed and dated by all parties, prior to any changes being

implemented. This MoA will be updated whenever significant revisions to this document are required.

Funding
Performance of the work described in this MOA is contingent upon BNL providing the necessary funding from re-directed RHIC operations funds.

Period of Performance of this MoA
This MoA will become effective upon the date of execution of signatures from all parties identified below. The MoA is terminated upon the completion of the sPHENIX Upgrade or if significant funding conditions change for Instrumentation that would otherwise prevent the sPHENIX scope from being completed.

Signatures:

9/13/2018

Berndt Mueller, Associate Lab Director for BNL Nuclear and Particle Physics Date

9/12/18

David Asner, Chair of the BNL Instrumentation Division Date

9/11/18

Edward O'Brien, sPHENIX Project Director Date