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SUBJECT: Gemstone Check In Process		

REVISION HISTORY

REVISION	DESCRIPTION OF CHANGE	DATE
A	<p>Initial Release</p> <p>Supersedes AB22A633 Preparation and Checkout of Gemstone Runs, AB22A635 Standard Operating Procedures, section 8.1 Gemstone Handling and section 8.2 Gemstone Pre-Processing Requirements, and AB723 Procedure for Gemstone Processing.</p>	

SUBJECT: Gemstone Check In Process**1.0 Purpose**

To define the process for Gemstone Check In.

2.0 Scope

This Practice applies to the check in of all gemstones AC deems suitable for irradiation, primarily, but not limited to, white topaz.

3.0 Reference Documents

- 3.1 ACP: 4.10 Inspection and Testing
- 3.2 ACP: 4.15.5 Gemstone Radioactive Material Transfer.
- 3.3 ACP: 4.13.1 Control of Nonconformances
- 3.4 ACP: 4.9.27 Production Planning
- 3.5 Attachment 1: Gemstone Check In Process Flow Chart
- 3.6 Attachment 2: VAX Gemstone Order/Statement Example
- 3.7 Attachment 3: Gemstone Process Control Record

4.0 Definitions

London Blue: gemstones of a steely blue color that are priced with a royalty included.

Processing tray: container in which gemstones are placed for irradiation.

5.0 Responsibility

The Production Manager is responsible for implementation of this Practice.

6.0 Practice

- 6.1 Locate the gemstones to be checked in. If received as a radioactive material transfer, use ACP: 4.15.5 Gemstone Radioactive Material Transfer.
- 6.2 Verify the customer supplied instructions against the actual product. **Warning Gemstones are very fragile and must be handled with extreme care.**
 - 6.2.1 For prepaid orders, verify the check is for the correct amount and paperclip the check to the customer supplied instructions
 - 6.2.2 If the verification fails, generate a Nonconformance Report in accordance with ACP: 4.13.1 Control of Nonconformances. Segregate and identify the product as nonconforming. Lock in safe if not resolved the same day.

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- 6.2.3 Repeat step 6.2 when the nonconformance is resolved.
- 6.3 Determine if the gemstones can be processed. If the stone(s) are
 - 6.3.1 wider or higher than the tray width or height, or
 - 6.3.2 fit in the tray but are more than two inches long,
 - 6.3.3 generate a Nonconformance Report in accordance with NESP: 4.13.1 Control of Nonconformances. Segregate and identify the product as nonconforming. Lock in safe if not resolved the same day.
- 6.4 Begin entering the order into the VAX. If more than one run for a customer, data entry for all runs can be accomplished at the same time.
 - 6.4.1 On the Windows 95 desktop, click on the Knot icon. Enter your Username and Password.
 - 6.4.2 At the **VAX1\$** prompt, type **MENU**. Select: **10)** Miscellaneous Menu, **5)** Linac Order Entry, **2)** Gemstone Orders, **1)** Enter a new order, **2)** Gemstones - Electron Beam.
 - 6.4.3 At the **ENTER CUSTOMER NUMBER** prompt, enter the customer project number, if known. If known, go to step 6.4.4.
 - 6.4.3.1 If unknown, type **?**. At the next prompt, type the first five letters of the customer name as it appears on the instructions.
 - 6.4.3.2 Choose the correct customer name/number and press Enter to accept.
 - 6.4.3.3 If the name does not appear, reenter with the whole name. If the customer still does not appear, it may be a new customer. Verify with the Production Manager.
 - 6.4.3.4 If a new customer, Escape the menu and select **4)** Maintain Customer Data, **1)** Basic Customer Data. At **Block #**, type **99008**, Enter and **Y**. Select **1)** Enter a New Customer and write down the customer number that appears. Enter data as

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required.

- 6.4.4 Respond to remaining prompts as required.
 - 6.4.4.1 VERIFY LOG # and RUN #, HOW MANY RUNS and DATE RECEIVED are self-explanatory:
 - 6.4.4.2 ENTER THE PROJECT NUMBER (always 99008).
 - 6.4.4.3 Press Enter to skip TASK NUMBER, REQUESTOR'S NAME, REQUESTOR'S PHONE, and ENTER F.O.B POINT.
 - 6.4.4.4 When MEGARADS, UNITS OF MEASURE, etc. displays, enter Megarads from the customer's instructions.
 - 6.4.4.5 At SAVE ORDER, press Y if complete, N to make corrections.
- 6.4.5 Print the order. See Attachment 2 for an example.
- 6.5 Using the VAX order printout, create the Folder and process the check, if any.
 - 6.5.1 Place a blank Gemstone Process Control Record (PCR, see Attachment 3) and all customer supplied paperwork in the folder.
 - 6.5.2 On the folder tab, enter the customer name, customer number (project number), PCN (VAX Log number plus **FY** plus last two digits of year. Example: **1111FY97**), and date of receipt.
 - 6.5.3 If the customer supplied instructions request processing that is not within the guidelines of this Practice, complete a Unique Processing Requirement and Checklist Form per NESP: 4.5.4 Developing Special or Unique Processing Requirements and include it in the folder. Check the "S/UPR" box on the PCR.
 - 6.5.4 Staple the check to the bottom half of the VAX printout, make a copy for the folder, and forward the check and original to AC Accounting.
- 6.6 On the PCR, enter the Process Control Number (PCN, also called Device History Record Number), the same as on the label, step 6.5.2. Enter additional data on

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the PCR as work is completed.

- 6.7 Weigh the gemstones, using the scale supplied.
 - 6.7.1 Use Ziploc bags. Ensure the bag weight is in the scale as a negative value. If the scale registers zero (0), set a bag on the scale and press the "On Tare" button.
 - 6.7.2 Label the bag with the customer name and run number.
 - 6.7.3 Transfer the gemstones from the customer bag to the Ziploc. Remove paper and plastic coverings but leave foil wraps intact. If not wrapped, observe stones for shipping damage or abnormalities.
 - 6.7.3.1 If damage appears excessive, photograph the stones and complete a Nonconformance Report per ACP: 4.13.1. Segregate and identify the gemstones and, if not resolved on the same day, lock them in the safe. When the nonconformance is cleared, return to step 6.6.
 - 6.7.4 Observe size of stones. Use the largest to determine beam energy.
 - 6.7.5 Segregate London Blues into a separate bag and weigh. Calculate the carats (grams x 5). Check the "London Blue" box on the PCR and enter the carats. Return the Blues to the bag with the other stones
 - 6.7.6 Weigh the loaded bag and enter the weight in the PCR.
 - 6.7.7 If a run's weight exceeds 2025 grams, remove the overage, put it in a small bag, label the bag with the customer name, run number, and the grams in the bag. On the PCR, enter the overage grams in "OVERAGE". Place the overage bag in the safe to be returned with the customer's processed stones. Overages are not processed.
- 6.8 If stones are white, go to step 6.9. Otherwise, check for radioactivity (activation).
 - 6.8.1 Using the Geiger counter, check the room's background level.

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- 6.8.2 Check both sides of the run and take the highest. If the run measures higher than background, record the count on the PCR at “RADIATION: BKGRD/PROD”. If less than twice background, go to step 6.9.
- 6.8.3 If the count is more than twice background, complete a Nonconformance Report per ACP: 4.13.1. Segregate and identify the nonconforming product and lock in the safe.
- 6.9 Load the gemstones into trays and identify. **Warning: Breakage is most likely to occur at this step.**
 - 6.9.1 Use small exposure trays for runs requiring double sided irradiation.
 - 6.9.2 Very small stones should be loaded in fine mesh trays.
 - 6.9.3 Ensure that gemstones are level, evenly distributed and the larger gemstones are on top.
 - 6.9.4 Check the area for stray stones.
 - 6.9.5 Fill out two aluminum identification tags.
 - 6.9.5.1 On the first tag, enter the PCN, the customer’s name, the run number, the total dose and the beam energy. If the customer does not designate an MEV, use the largest stone sizes to determine beam energy.
 - 6.9.5.1.1 Small (less than 5 grams each), 12 to 13.9 MeV.
 - 6.9.5.1.2 Medium (5 to 14 grams each), 14 to 15.9 MeV.
 - 6.9.5.1.3 Large (15 grams or more), no lower than 16 MeV.
 - 6.9.5.2 Customer-specified MeV cannot be changed without customer permission.
 - 6.9.5.3 For the second tag, determine if the run will be one- or two-sided. Two-sided radiation (flipped) is used where the majority

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of stones weigh less than 15 grams a piece.

6.9.5.4 Enter “No Flip” for one-sided. For two-sided, enter “Side I” with half the total dose for the first of the two-sided run.

Example: **Side I @ 3,000**

6.9.6 Attach the tags to the tray.

6.9.7 Sign the PCR at “TRAY LOADED BY.”

6.10 Complete the PCR with the following data. Refer to the customer supplied instructions as needed.

6.10.1 Customer number and name.

6.10.2 Run number (from the VAX report).

6.10.3 Energy in MEV.

6.10.4 Check the “FLIP” box if the gemstones are being flipped.

6.10.5 Check the “HEAT” box if the customer supplied instructions request heat treatment.

6.10.6 Check the “S/UPR” box if the customer supplied instructions require the product to be processed, stored or shipped differently than normal practices dictate.

6.10.7 Dose (in Mrads). If “FLIP” is checked, divide the dose in half and enter.

6.10.8 Any special processing items in “COMMENTS.”

6.10.9 Your name at “Verification By”.

6.11 Complete the VAX data entry by selecting ADDITIONAL LINE ITEMS and entering:

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- 6.11.1 Carat weight for London Blues, if applicable.
- 6.11.2 Shipping charges. If the customer does not have a shipping account with AC, the shipping charges are \$30 for every one to two shipments processed.
- 6.11.3 Unpackaging fee, if applicable. Charge \$100 if stones arrived individually wrapped in paper or plastic. Do not charge for foil wrapped.
- 6.11.4 If the customer has not pre-paid, use the option to print a customer statement with the order. Fax the statement to the customer.
- 6.12 Forward the folder and the trays to the Production Gem Handling Room for processing.
 - 6.12.1 Place the loaded trays in the storage cabinet, from left to right, according to priority, in the order received.
 - 6.12.2 Put the folders in the back wall pocket in the gemstone staging area, in priority from front to back.
- 6.13 To schedule processing, see ACP: 4.9.27 Production Planning.

7.0 Records

Gemstone Process Control Records and folders are maintained in Quality Assurance for five years.

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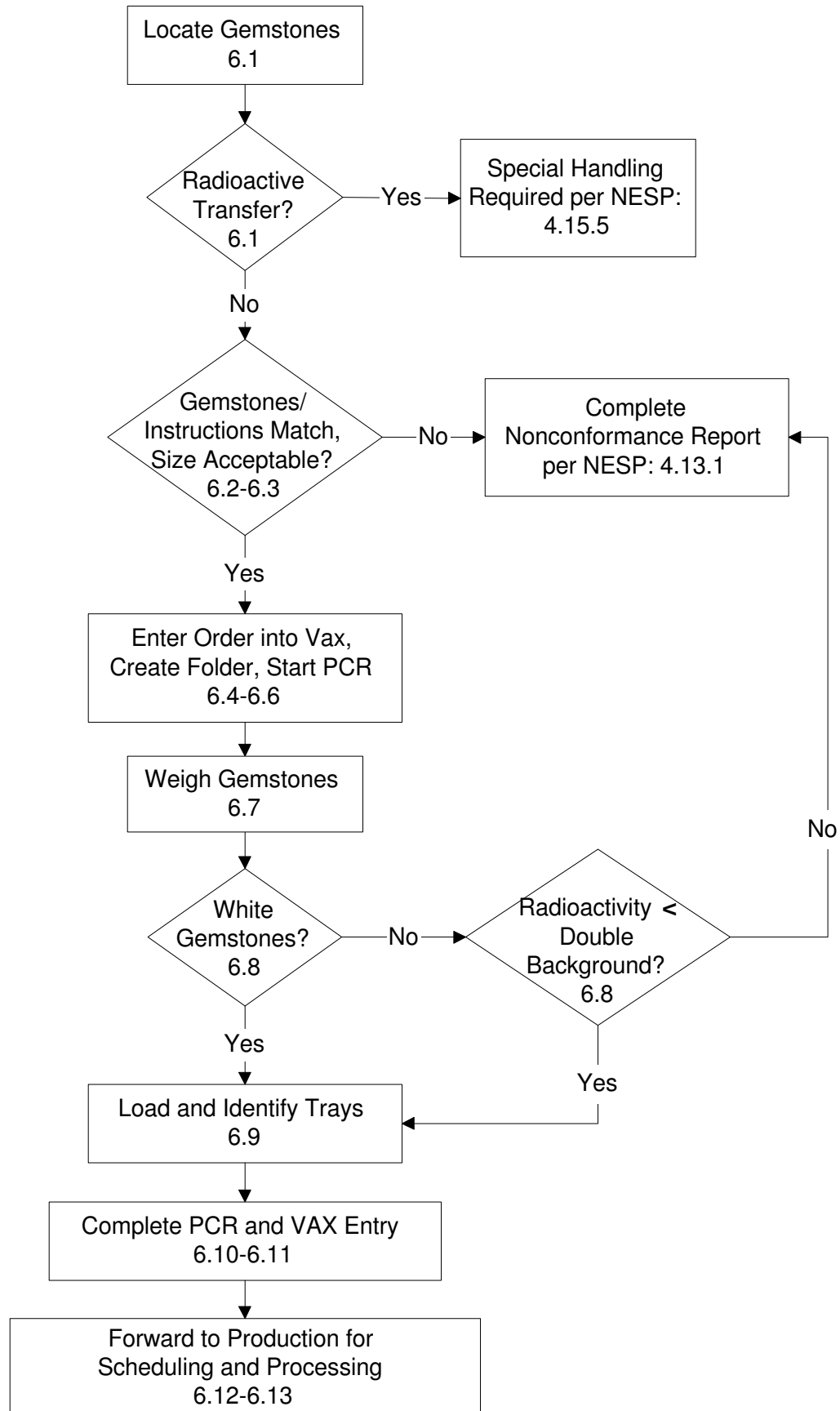
PREPARED BY:

Author: _____ Date _____
 George A. Helper
 Customer Service

APPROVED BY:

Process Owner: _____ Date _____
 John Producer
 Production Manager

Reviewer: _____ Date _____
 Darlene Excellence
 Quality Manager



VAX Gemstone Order/Statement Example

Gemstone Process Control Record

PROCESS CONTROL NUMBER _____ LONDON BLUE CARATS _____
 CUSTOMER NUMBER _____ CUSTOMER NAME _____

INCOMING ITEM INFORMATION							
CUSTOMER RUN NUMBER	WEIGHT	OVERAGE	ENERGY	FLIP	HEAT	S/UPR	DOSE PER SIDE
RADIATION: BKGRD/PROD	VERIFICATION BY			TRAY LOADED BY			
COMMENTS:							

SIDE 1

IRRADIATOR NUMBER _____ PRESCALE VALUE _____
 BEAM CURRENT _____ TUNE RECORD NUMBER _____ SCAN WIDTH _____
 GEMSTONE IRRADIATION CONTAINER POSITION _____ LOADED BY _____
 START DATE/TIME _____ STARTED BY _____
 COMPLETION DATE/TIME _____ COMPLETED BY _____
 DATE/TIME FLIPPED _____ FLIPPED BY _____

SIDE 2

IRRADIATOR NUMBER _____ PRESCALE VALUE _____
 BEAM CURRENT _____ TUNE RECORD NUMBER _____ SCAN WIDTH _____
 GEMSTONE IRRADIATION CONTAINER POSITION _____ LOADED BY _____
 START DATE/TIME _____ STARTED BY _____
 COMPLETION DATE/TIME _____ COMPLETED BY _____

PROCESS DEVIATIONS					
TIME TOTALS					
	SETUP TIME	TUNE TIME	MAINT TIME	OTHER TIME	PROCESS TIME
SIDE 1					
SIDE 2					
TOTALS					

DATE/TIME TRAY UNLOADED _____ UNLOADED BY _____
 BERYL? _____ GRAMS REMOVED: _____ NUMBER OF STONES: _____
 RELEASABLE _____ ACTIVATION CHECK PERFORMED BY: _____