SECOR
International Incorporated

November 12, 1996

Mr. Todd Jackson
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

SUBJECT: RESPONSE TO COMMENTS
FORMER TENNECO POLYMERS, INC. FACILITY
FORDS, NEW JERSEY

Dear Todd:

This letter has been prepared in response to your comments to the Work Plan prepared for the radioactive materials decommissioning program at the former Tenneco Polymers, Inc. (Tenneco) facility in Fords, New Jersey. The following paragraphs have been developed to address the comments you made in your November 5, 1996 letter, and if acceptable, will be incorporated into the Work Plan.

Item 2 ***Describe the beta emission limit that will be used in the field, as well as its basis.***

Insert the following as the last paragraph of Section 3.2:

The decay scheme of U-238 in equilibrium with only Th-234 and Pa-234 shows two easily measured beta particles per alpha decay. Therefore, the "derived limit" using beta emissions would be approximately two times the alpha limit. For fixed plus removable contamination, neglecting self absorption difference, the guideline beta value would therefore be 10,000 dpm per 100 cm^2. For detection purposes, a large (75 square centimeters) ZnS(Ag) alpha scintillation probe will be used. The MDA for this probe is approximately 15 dpm per 100 cm^2 using a count rate meter readout device. This probe will be used to evaluate fixed contamination while verification of removable contamination will be by wipe test analysis as described in Section 3.10.2, while a summary of the instrumentation to be used is provided in Section 3.10.8.

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Also, in Section 3.10.8, two probes will be summarized for the Ludlum Model 12 as follows:

Probe	LLD	Efficiency
Model 43-1	15 dpm/100 cm2	0.28 cpd
Model 43-2	70 dpm/100 cm2	0.28 cpd

Item 3 ***Confirm that the intent of the removal activities will be to achieve the conditions for release of the property for unrestricted site use.***

Based on the available options, and the limitations associated with the site conditions to readily meet the design criteria for on-site burial in accordance with Options 2 through 5, Option 1 was chosen. It is the intent of the removal activities to meet the criteria of Option 1 as outlined in F.R. 46, No. 205.

Insert the following as a replacement for the first sentence of the third paragraph of Section 3.2.

The intent of the decommissioning program defined within this Work Plan will be to meet the applicable cleanup standards criteria for Option 1 noted in F.R. 46, No. 205, Friday, October 23, 1981, Section II.1.

Items 8,9 ***Describe the methodology used to grid building surfaces and the number of systematic measurements of surface activity that will be made.***

Insert the following paragraphs as Sections 3.7.1 and 3.7.2 after the fourth paragraph of Section 3.7.

3.7.1 Baseline Screening Protocol

A format for screening of the site has been developed to guide field operations. This format has been developed to meet or exceed the frequency of data provided, as recommended by NUREG/CR-5849. In general, the following protocol will be used to define the screening process:

* Affected Areas - One hundred percent of affected areas within indoor as well as outdoor locations will be screened as part of the decommissioning program. Screening within each of the affected areas will be guided using a 1-meter square grid system to support documentation of the screening effort. Screening activities will include gamma exposure rate measurements at the surface and at a height of 1-meter above the surface,

as well as samples that will be submitted for laboratory testing. The frequency of sampling will be determined based upon the total impacted area identified, although it is anticipated that at least 30-samples will be obtained for testing in the on-site gamma spectroscopy laboratory.

Within buildings, foundations, or other areas containing affected building materials, screening will include a determination of the presence of fixed versus removable contamination.

* Unaffected Areas - Within unaffected areas, a minimum of ten percent of the land area will be subject to screening and documentation as part of the decommissioning program. The grid system used for unaffected areas will utilize a 10-meter square grid. Gamma exposure rates will be obtained from within each of the grids at the surface and at a height of 1-meter. These exposure rates will be supported by samples within at least 30 locations that will be subject to analysis using the on-site gamma spectroscopy laboratory.
* Potentially-Affected Areas - Areas that are potentially affected such as the wastewater treatment plant and surface water drainage areas, will each be subject to screening and sampling using a three meter square grid system. Screening will be performed by obtaining exposure rate data at the surface and at a height of 1-meter, while samples will be obtained at a frequency of 1 sample for each 100 square meters. Should any radioactive residuals be identified, these areas will be considered as "affected" and will be gridded, screened, and sampled using the Affected Areas protocol.

Each component of the grids developed will be surveyed at the surface and at a height of 1-meter to determine the gamma exposure rate. These measurements will be used to guide the decontamination and removal activities. The on-site gamma spectroscopy laboratory will also be used to analyze periodic samples obtained from within grid components so that the exposure rates are supported with analytical data.

The screening data developed will be used for decommissioning activities to support the removal of residual radioactivity from building surfaces, or to support the excavation of impacted soils. Once the removal activities are determined complete using the site instrumentation, verification samples will be obtained and sent to an off-site laboratory for analysis. It is anticipated that a total of 30 samples will be obtained for verification from within both affected and non-affected areas. Only once all samples have verified that the cleanup levels have been consistently achieved will the NRC be notified for performance of the final verification survey.

3.7.2 Delineation of Screening Grid System

It is planned that the entire footprint of buildings K-12 and K-12A, as well as the foundation for Building K-7 be gridded under the assumption that they represent "affected areas". Therefore, each of the floors within these buildings will be gridded using a 1-meter square grid system that will be labeled using an alpha-numeric system. The grid coordinates will be marked on the walls and the floors of the structures as necessary to ensure accurate documentation. The grid system developed will be unique to each structure. A determination of the exact grid coordinate system will be made once in the field so that the footprint of each building can be delineated in a detailed manner and the structural components best accommodated. The selection of a grid system specific to each structure will be to support the ease of documentation a series of AutoCAD base maps.

Within the indoor locations of K-12 and K-12A, a vertical grid system will also be employed to assess the walls and ceilings of these structures. Using the 1-meter grid system, a systematic measurement will be made of the exposure rate within each grid. The approach employed for screening horizontal and vertical surfaces will be to provide data at a frequency that meets or exceeds that specified in NUREG/CR-5849.

Within outdoor locations, a similar form of grid system is anticipated with the final grid being marked once clearing has been completed using surface monuments and stakes. This will facilitate the ability to perform detailed screening once removal activities are completed as part of the final verification survey.

Item 10 *Provide available data for groundwater for Wells M23S-1 and M23S-2*

Insert as the third paragraph of Section 3.10.4:

As part of the groundwater monitoring program, two existing monitoring wells (M23S-1 and M23S-2) will also be sampled with each sample subject to an evaluation of the uranium isotopes present.

Insert the following as the last paragraph of Section 3.10.4:

The groundwater sampling program will be performed as part of the initial phases of field work to support early analytical detection of any radioactive groundwater impacts. Once the sample results have been obtained, an interim Groundwater Quality Report will be prepared and submitted to the NRC for review. This report will be prepared using both the radiological data obtained from hydropunch samples, as well as the groundwater data from previous monitoring well sampling episodes at the site. Extensive sampling of wells at the facility to assess chemical contamination of groundwater has been performed and used to characterize hydrogeological conditions such as transmissivity, gradient, and groundwater flow direction. This work has been performed under defined

protocols and regulatory oversight by the New Jersey Division of Environmental Protection (NJDEP) and a summary of pertinent data will be provided as part of the interim report.

Based on the interim sampling data developed, a course of action will be identified to either obtain more samples or eliminate the need for additional samples based on the results obtained. A determination of the need for further samples will be made jointly through review of the data with the NRC. The frequency of samples and the validity of the data in identifying the extent of potential radiological impacts in groundwater will be the primary determinants used to assess the need for further assessment or remediation. If further work is required for either characterization or remediation, a separate Work Plan will be prepared and submitted to the NRC for review.

Item 11a ***Provide additional data outlining the characterization of soils beneath the concrete.***

Replace the second paragraph of Section 4.2.2 with the following:

As noted in Section 3.8.4, the extent of radioactive contamination within indoor areas will be mapped using 1-meter square grid components. These components will form the basis for delineation of radioactivity, as well as the limits for concrete removal when required to provide for screening of the underlying soil.

All concrete exhibiting cracks will be removed to assess the potential for radioactive influences below the slab. Concrete will typically be removed along the limits of the 1-meter grid components. Within the limits of intact (no discernable cracks) concrete slabs, screening of soils beneath the slabs will be performed by obtaining soil samples at a frequency of 1 sample for each 4-square meters of intact concrete. These samples will be obtained by coring a 1.5-inch hole through the concrete slab using a hammer drill with a masonry bit. Samples of the underlying soil will be obtained using a 1.5-inch diameter push tube sample from immediately beneath the slab to a depth of 1-foot. These samples will each be documented and placed in labeled paint cans for counting using the on-site gamma spectroscopy laboratory. If radioactive influences greater than two standard deviations above background are determined, the floor slab within the 4-square meter area will be removed and subjected to further screening.

Item 13,15 ***Provide a survey plan for conducting assessments of surface water drainage features.***

Insert as Section 3.8.6 the following:

3.8.6 Outdoor Gamma Exposure Rate Surveys - Surface Water Drainage Areas

As part of the site walkover survey, surface water drainage within the area around the impacted facilities will be assessed. Any areas which are downgradient receptors for surface water flow from affected locations will be subject to detailed gamma exposure rate screening and sampling. Prior to screening, each drainage basin will be delineated using a 3-meter square grid. Each grid component will be screened to determine the exposure rate at the surface and at a height of 1-

meter. Each of the readings obtained will be recorded on an AutoCAD base map of the surface water drainage area.

To support the exposure rate survey, one soil sample will be obtained from each 100 square meters within the drainage basin and from each point where potentially impacted surface water could have entered features such as topographic lows, sewers, or manholes. Each of the samples collected will be placed in clean containers and counted using the on-site gamma spectroscopy laboratory. The results of these tests will each be recorded and used for any clean-up related determinations.

Further, add the following paragraph after the second paragraph of Section 3.10.5:

In addition to tracing and screening drains from the impacted process facilities, the fate of such drainage will be assessed. Floor drains are anticipated to drain to the on-site wastewater treatment system. Accordingly, this entire facility will be subject to screening using the same protocols as used for the affected structures and appurtenant process piping. Any sludges deposited within tanks or other portions of the water treatment facility will be screened using exposure rate surveys, as well as sampling. The frequency of sampling will be based on the conditions noted as the facility is dismantled in support of the screening process. Samples obtained will be screened using the on-site gamma spectroscopy laboratory. The LLD for sediment samples is 12 pCi/g for U-238 for a 50-minute count.

As part of the wastewater treatment plant screening process, an assessment will be made of the area used for disposition of the treated water. Based on available data, the treated water was apparently discharged to a series of two ponds as shown on Figure 3. The volume of water flow into these ponds, and the fate of water once discharged, is not known. However, since this area is considered to be potentially-affected, a walk-over exposure rate survey using 3-meter square grid component will be performed within the limits of these ponds. Soil samples will be obtained from at least five locations within each pond and counted using the on-site gamma spectroscopy laboratory. If any affected areas are identified, then further characterization will be performed in conformance with the protocols identified in Section 3.7.1 and NUREG/CR-5849.

Item 19 ***Provide information on how residual concrete saw cooling water will be managed.***

Insert the following sentence after the sixth sentence in paragraph three of Section 4.2.2:

Water generated will be recovered using a wet/dry vacuum and placed in a clean 55-gallon drum and allowed to evaporate.

Then start new paragraph.

Item 22 ***Provide additional information on the detection methods used for quantifying the concentration of radioactive materials in the air.***

Insert the following paragraphs after the last paragraph of Section 3.10.7:

Air sampling, as discussed in 3.10.7, will be conducted as close to the breathing zone of workers as practicable. A High-Volume (Hi-Vol) sampler will be used and the filters (membrane type) counted using a gas-flow proportional counter at Colorado State University. The a priori LLD for the counter is 0.004 pCi/liter using a counting time of 100-minutes with a total air volume of 1000-liters. Correction for dust loading will be made for each test and the time spent in any aerosol will be recorded as will the DAC-hour exposure of each worker.

In general, work will be performed to prevent the generation of dusty aerosols . If such conditions are developed, workers will be provided with respirators consistent with the requirements of 10 CFR, Parts 19 and 20. The respirator filters for each worker will be collected, analyzed by the SHSO, and documented to further evaluate possible workplace exposure. In no case will a worker be allowed a U-238 intake of greater than 1 DAC-hour per day or a corresponding inhalation intake of greater than 0.1 the ALI.

Item 23 *Clarify whether Dr. Johnson is a C.I.H. or a C.H.P.*

Dr. Johnson's resume has been corrected using the proper abbreviation (C.H.P.) for Certified Health Physicist. He was first certified in 1968 and has been recertified to date.

Item 24 ***Confirm that the Site Health & Safety Officer will be responsible for ensuring that all records are maintained.***

The Site Health and Safety Officer will be responsible for maintaining all records and the Health and Safety Plan will be modified accordingly.

Item 28 ***Submit the requested QA/QC procedures for review.***

Insert the following as the last paragraph in Section 3.10.9:

A copy of the QA Plan for the proposed decommissioning program is provided in Appendix B.

Also see the attached Appendix B.

Item 29 ***Provide information on the method to be used to ensure that the limit for removable contamination is not exceeded.***

After surface decontamination, remaining removable contamination will be documented by obtaining filter paper wipes over a 100 square centimeter area. The wipes will be counted using a gas-flow proportional counter for alpha activity and for beta activity. This counter will provide an MDA of 4 pCi using a count time of 100 minutes for each wipe sample, and will thus meet the requirements for determining whether the limits for removable activity are exceeded. Using the data developed from sampling, efforts will be made to reduce removable and fixed contamination to as-low-as-reasonably-achievable (ALARA) values.

SUPPORTING INFORMATION

A. ***Describe the Tenneco and SECOR organizations and identify the responsible personnel for site health and safety.***

The Tenneco organization responsible for the project is Tenneco Business Services (TBS) which is an internal technical group that manages all residual environmental liability for Tenneco Polymers and other former operations. The TBS contact responsible for this project is Mr. Roger Towe who can be reached at (713) 757 - 7685.

The SECOR organization responsible for performing the work on behalf of Tenneco is led by Mr. Dale Evans, P.E. who can be reached at (303) 763-8800. Mr. Evans will be responsible for assigning staff to the project and will be directly involved with all facets of the field work, report preparation, and final confirmatory surveys.

As noted in the Health and Safety Plan, Dr. James Johnson, Ph.D., C.H.P. will serve as the Site Health& Safety Officer and will perform and manage all employee health screening and exposure surveys. Dr. Johnson will perform all site-specific training and will be present at the site during key aspects of the decommissioning program. In his absence from the site, Mr. Andrew Schwartz, or Mr. Dave Evans will be responsible for these activities. Both of these personnel have direct experience with this responsibility and have had radioactive materials safety training.

B. ***Confirm that all site activities will be conducted in accordance with written procedures approved by Corporate Management.***

SECOR will perform all work required for the decommissioning program in accordance with the Work Plan and SECOR's applicable Policies and Procedures Directives that have been approved by SECOR's President and Chief Executive Officer, Dr. James A. Young.

C. ***Provide a Project Schedule for the activities to be performed, as outlined by the Work Plan.***

A schedule for the decommissioning work outlined within the Work Plan is provided in the attached Figure 3. This schedule will be highly dependant upon the conditions encountered in the field. As such, once more detailed screening results become available, a revised schedule will be prepared and submitted to the NRC for review. A copy of the revised schedule will also be submitted to the New Jersey Bureau of Environmental Radiation (NJDEP-BER) to support project documentation requirements as part of the ISRA process.

CLOSING REMARKS

SECOR appreciates your expedited review of the Work Plan and hopes that the information submitted within this letter meets the NRC's needs. If you have any questions, or if I can be of assistance, please give me a call.

Sincerely,

SECOR International Incorporated

Dale W. Evans, P.E.
Vice President, Chief Engineer

Attachments

cc: Roger Towe - Tenneco Business Services

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APPENDIX A

QUALITY ASSURANCE PROJECT PLAN
RADIOACTIVE MATERIALS DECOMMISSIONING

SECOR's Radiological QAPP

Quality assurance will be a key component of the proposed decommissioning program to ensure that all activities performed are protective of human health and the environment and that the data generated is of a sufficient frequency and quality to meet the needs for final confirmation that all cleanup levels have been met. To meet these needs, SECOR International Incorporated (SECOR) has prepared this Quality Assurance Project Plan (QAPP) for radioactive materials decommissioning. This plan outlines the data quality objectives, the basis for survey design, and the methods to be used for analytical evaluations and documentation. The procedures defined by the QAPP will provide for consistent and uniform implementation of field work throughout each phase of the field work. The following sections summarize the various portions of the QAPP requiring consideration.

QAPP.1 APPLICABLE STANDARDS

The QAPP process outlined is consistent with ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities (ANSI 1989). As such, the procedures outlined within this QAPP provide details with respect to the program employed for quality assurance specific to SECOR's operations.

QAPP.2 ORGANIZATIONAL STRUCTURE

The organization structure for the proposed decommissioning work will provide personnel with direct experience in radiological screening, decontamination, demolition, and final confirmatory actions consistent with decommissioning criteria. The project organization for the proposed work is as follows:

Project Manager - Dale W. Evans, P.E.

QA Officer - Dale W. Evans, P.E.

C.H.P./S.H.S.O. - James Johnson, Ph.D., C.H.P.

Field Foreman - Dave Evans

Under the organization presented, SECOR will perform the decommissioning work required using all applicable personnel required to maintain consistency with this QAPP. The individual responsibilities for each of the key functions outlined will be as follows:

Project Manager - The Project Manager will be responsible for directing the work and will be SECOR's key point of contact with the Client and with the Regulatory Agencies. The Project Manager will also identify and assign the resources necessary to complete the work consistent with this QAPP. Work performed as part of the project will be reviewed and determinations made of activities required to remain consistent with the QAPP, or where any alterations of the plan must be made to accomplish the decommissioning goals.

QA Officer - The QA Officer is responsible for reviewing the data generated during the decommissioning process and ensuring that the procedures employed to manage all data generated is consistent with this QAPP. Accordingly, the QA Officer will serve as the focal point for all survey QA activities and will oversee the survey by conducting internal audits.

C.H.P./S.H.S.O. - The Certified Health Physicist/Site Health & Safety Officer functions have been combined for this project based on the desire to have the most qualified individual serve is both roles. As such, the C.H.P./S.H.S.O. will be responsible for all worker baseline exposure monitoring, radiological and site-specific training, and field monitoring of potential workplace exposures. Further, the C.H.P./S.H.S.O. will also be responsible for the development of written documentation specific to the potential degree of workplace exposure.

Field Foreman - The Field Foreman will be responsible for managing field decommissioning activities. As such, this person will manage all site set-up activities consistent with the Work Plan, ensure that decommissioning work performed is consistent with the Work Plan, and provide the oversight necessary to protect against any fugitive releases. Accordingly, this work may include varied activities such as field screening, set-up of support facilities, excavation, decontamination, and demolition.

QAPP.3 DOCUMENTATION REQUIREMENTS

All aspects of the project will be documented in detail to ensure adequate representation of the work performed and the ability to duplicate confirmatory measurements. Documentation of the work process will be in accordance with accepted industry standards and will provide a summary of all procedures and activities performed during the project. The following activities will each be subject to documentation, among others:

* Site Set-Up - The methods used for site set-up will be identified, such as the location of key support functions, clearing of outdoor and indoor areas, and the screening performed to identify work zones.

* Radioactive Materials Storage - The area(s) used for radioactive materials packaging and storage will be documented, as will the final survey of the area to confirm that no radioactive residuals remain.

* On-Site Analytical Capabilities - The use of an on-site analytical laboratory may be appropriate to support the work performed. The use of the laboratory, calibration data, and other operating parameters will be identified.

* Site Screening Instruments - The instruments used for site screening will be adequate to provide the detection limits required to ensure all work meets with applicable cleanup criteria. The instruments used, their detection limits, and their calibration information will each be identified.

* Site Screening - All data obtained from the screening activities will be recorded using a defined grid coordinate system capable of providing reproducible data as part of the final confirmatory survey. All data will be recorded in a hard copy written form.

QAPP.4 TRAINING OF STAFF

All staff assigned to work potentially involving exposure to radioactive materials will be subject to training with respect to radioactive principles, site-specific hazards, screening procedures, documentation requirements, and decommissioning procedures. This training will be provided as part of a site-specific training class the results of which will be summarized and recorded.

QAPP.5 EQUIPMENT MAINTENANCE AND CALIBRATION

Equipment used to evaluate radioactivity will be maintained, calibrated, and tested prior to commencing work to ensure the validity of the data developed. The operation of this equipment and the recordation of data developed will be performed by only those personnel that have been trained and can demonstrate proficiency with such activities.

All equipment calibration will be performed based on the use of accepted standards such as those traceable to the National Institute of Standards (NIST). If necessary, the instruments used will be calibrated at various times during the work to ensure the validity of the data developed.

QAPP.6 DATA MANAGEMENT

Data management will be performed to ensure the consistency, accuracy, and detail necessary for decommissioning activities. All data developed will be recorded in bound logbooks with support, as appropriate, using electronic media. All recorded information will be placed in the logbook so that a clearly defined reference can be made to the location from which the data was obtained. Further, all calculations pertinent to the data will also be retained to support data review and interpretation.

The data developed will be reviewed on a weekly basis by the QA Officer to ensure adequate representations of the screening activities are made on a consistent basis. All review work will be signed and dated. The data reviewed will be subject to filing to provide for permanent data retrieval.

QAPP.7 SAMPLE COLLECTION/DOCUMENTATION

Samples collected in support of the decommissioning process will be subject to placement in appropriate sample containers at the point of sampling. The containers used will be sealed immediately and labeled with the sample location, date, and other pertinent information. The location, depth, and characteristics of each sample will be noted in the field logbook, as well as the process used for any analytical determinations. These samples will then be transported directly to the on-site laboratory, or shipped to the off-site laboratory for analysis. Samples subject to shipment to an off-site laboratory will be subject to detailed chain-of-custody procedures as outlined in the following section.

QAPP.8 CHAIN-OF-CUSTODY

A chain-of-custody form will be completed for all samples generated that are subject to analysis by an off-site laboratory. The chain-of-custody form developed will provide for data that ensures sample custody is tracked from the site through the shipping process, to the laboratory. To support this process, custody seals will also be used to ensure that shipments of materials are not altered.

Figure 3: **Projected Schedule**
Radioactive Decommissioning Program
Fords, New Jersey