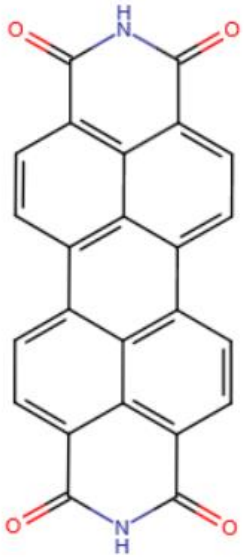
United States Environmental Protection Agency
Office of Chemical Safety and Pollution Prevention

Summary of External Peer Review and Public Comments and Disposition for C.I. Pigment Violet 29 (PV29) (Anthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetrone)

Response to Support the Final Risk Evaluation of C.I. Pigment Violet 29

CASRN: 81-33-4



January 2021

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Introduction

Draft Risk Evaluation for C.I. Pigment Violet 29

EPA published the *Draft Risk Evaluation for C.I. Pigment Violet* 29 (EPA-HQ-OPPT-2018-0604-0007) ("draft risk evaluation") on December 11, 2018. As per EPA's final Risk Evaluation Rule, *Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act* (82 FR 33726), the draft risk evaluation was subject to both public comments and peer review, which are distinct but related processes. EPA provided 60 days for public comment on all aspects of the draft risk evaluation, including the submission of any additional information that might be relevant to the science underlying the risk evaluation. This satisfied TSCA Section 6(b)(4)(H), which requires EPA to provide public notice and an opportunity for comment on a revised draft risk evaluation prior to publishing a final risk evaluation.

EPA accepted public comments on the draft risk evaluation until January 14, 2019. EPA accepted additional public comments from April 17, 2019 until May 17, 2019 following the release of 24 studies used in the draft risk evaluation as well as the updated systematic review documents. EPA accepted a third round of public comments from June 10 to July 10, 2019 after publication of the C.I. Pigment Violet 29 Inhalation Risk Characterization Summary and Updated Charge Questions for the Science Advisory Committee on Chemicals (SACC) peer review of the draft risk evaluation held June 18-21, 2019. A report of the SACC peer review results was published in September 2019. Materials on the draft risk evaluation are available at www.regulations.gov in docket EPA-HQ-OPPT-2019-0437.

EPA appreciates the valuable input provided by the SACC peer review panel and the public. The first portion of this document summarizes the SACC peer review and public comments received by EPA on the draft risk evaluation and provides EPA's responses to the comments received. The SACC peer review Updated Charge Questions[1] are used to categorize the peer review and public comments on the draft risk evaluation into specific issues related to ten main themes.

Overall Content, Organization, and Presentation of the Document
Systematic Review Approaches and Clarity
Physical Chemical Properties and Environmental Fate
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Environmental Effects
Human Health
Risk Characterization and Risk Determination
Supplemental Analysis
Peer Review Comments on Confidential Business Information (CBI) Material
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Revised Draft Risk Evaluation for C.I. Pigment Violet 29

On June 6, 2019, EPA released a quantitative human health inhalation risk characterization approach. This approach used toxicity information for an analogue, barium sulfate to estimate risks to workers from inhalation of C.I. Pigment Violet 29 dust in a manufacturing facility. This approach is described in a summary document released to the docket (EPA-HQ-OPPT-2018-0604-0052).

[1] These are the questions that EPA/OPPT submitted to the panel to guide the peer review process.

In the draft risk evaluation, EPA preliminarily concluded that C.I. Pigment Violet 29 does not pose unreasonable risks to public health or the environment. During the review of the draft risk evaluation by the SACC, uncertainties were identified concerning C.I. Pigment Violet 29 solubility and occupational worker inhalation exposure. EPA gathered additional data to address critical uncertainties identified in the draft risk evaluation indicated by the SACC and in public comments. Where data received from the manufacturing stakeholders was determined to be deficient, EPA utilized its information gathering authorities under TSCA Section 4. On February 28, 2020, EPA issued a TSCA Section 4(a)(2) Test Order for the generation and submission of solubility testing in water and octanol, as well as a respirable dust monitoring study. More information can be found in the TSCA Section 4 Test Order docket (EPA-HQ-OPPT-2020-0070).

In October of 2020, EPA published a *Revised Draft Risk Evaluation for C.I. Piment Violet* 29 (EPA-HQ-OPPT-2018-0604-0007) ("revised draft risk evaluation") on October 30, 2020. EPA accepted public comments on the revised draft risk evaluation from October 30 to November 30, 2020 and extended the public comment period for an additional 20 days to December 19, 2020. EPA also conducted a Letter Peer Review of the revised draft risk evaluation from October 30 to November 30, 2020. The charge questions for the external peer reviewers are found here. The Letter Peer Review report on the revised draft risk evaluation can be found here: EPA-HQ-OPPT-2018-0604-0107. Materials on the revised draft risk evaluation are available at www.regulations.gov in docket EPA-HQ-OPPT-2018-0604.

EPA appreciates the valuable input provided by the Letter Peer Review and the public. The second portion of this document summarizes the Letter peer review and public comments received by EPA on the revised draft risk evaluation and provides EPA's responses to the comments received. EPA's responses to comments received from the general public and the Letter Peer Reviewers are provided in separate sections. Responses to the Letter Peer Review are organized by Charge Questions, while responses to public comments are organized into specific and general issues.

Comments on the Draft Risk Evaluation for C.I. Pigment Violet 29

List of Comments Submissions

#	Docket File	Submitter
8	EPA-HQ-OPPT-2018-0604-0008	Stacy Tatman, Director, Environmental Affairs, Alliance of Automobile Manufacturers (Alliance)
9	EPA-HQ-OPPT-2018-0604-0009	Michelle Roos, Executive Director, Environmental Protection Network (EPN)
10	EPA-HQ-OPPT-2018-0604-0010	Georges C. Benjamin, Executive Director on behalf of American Public Health Association (APHA)
11	EPA-HQ-OPPT-2018-0604-0011	David Michaels, Epidemiologist, Professor, Environmental and Occupational Health, Milken Institute School of Public Health, George Washington University
12	EPA-HQ-OPPT-2018-0604-0012	Jonathan Kalmuss-Katz, Staff Attorney, Earthjustice and Randy Rabinowitz, Executive Director, Occupational Safety & Health Law Project
13	EPA-HQ-OPPT-2018-0604-0013	Richard A. Denison, PhD, Lead Senior Scientist, on behalf of Environmental Defense Fund (EDF)
14	EPA-HQ-OPPT-2018-0604-0014	Veena Singla, Associate Director, Science and Policy, Program on Reproductive Health and the Environment, University of California, San Francisco (UCSF) et al.
15	EPA-HQ-OPPT-2018-0604-0015	Brett Fox, International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America (UAW)
16, 16(S)	EPA-HQ-OPPT-2018-0604-0016	Liz Hitchcock, Acting Director, Safer Chemicals Healthy Families et al.
17	EPA-HQ-OPPT-2018-0604-0017	Suzanne Hartigan, Senior Director, Regulatory and Technical Affairs, American Chemistry Council (ACC)
18	EPA-HQ-OPPT-2018-0604-0018	Rebecca L. Reindel, Senior Safety & Health Specialist, AFL-CIO
19	EPA-HQ-OPPT-2018-0604-0019	David Wawer, Executive Director, Color Pigments Manufacturers Association (CPMA)
20	EPA-HQ-OPPT-2018-0604-0020	Ansje Miiller, Director of Policy and Partnerships, Center for Environmental Health et al.
37	EPA-HQ-OPPT-2018-0604-0037	Jennifer Sass, Senior Scientist, Natural Resources Defense Council (NRDC)
43	EPA-HQ-OPPT-2018-0604-0043	Hanna Vesterinen, Research Consultant to UCSF PRHE et al.
44	EPA-HQ-OPPT-2018-0604-0044	Jonathan Kalmuss-Katz, Staff Attorney, Earthjustice and Randy Rabinowitz, Executive Director, Occupational Safety & Health Law Project
45	EPA-HQ-OPPT-2018-0604-0045	David Wawer, Executive Director, Color Pigments Manufacturers Association, Inc. (CPMA)
46, 46(S)	EPA-HQ-OPPT-2018-0604-0046	Richard A. Denison, Environmental Defense Fund (EDF)

#	Docket File	Submitter
47	EPA-HQ-OPPT-2018-0604-0047	Suzanne Hartigan, Senior Director, Regulatory and Technical Affairs, American Chemistry Council (ACC)
48	EPA-HQ-OPPT-2018-0604-0048	Liz Hitchcock, Acting Director, Safer Chemicals Healthy Families (SCHF) et al.
49	EPA-HQ-OPPT-2018-0604-0049	Kathy Pope, Environmental Protection Network (EPN)
55	EPA-HQ-OPPT-2018-0604-0055	Liz Hitchcock, Safer Chemicals Healthy Families (SCHF) et al.
71	EPA-HQ-OPPT-2018-0604-0071	Richard A. Denison, Environmental Defense Fund (EDF)
72	EPA-HQ-OPPT-2018-0604-0072	Suzanne Hartigan and Christina Franz, Senior Directors of Regulatory & Technical Affairs, American Chemistry Council (ACC)
73	EPA-HQ-OPPT-2018-0604-0073	Suzanne Hartigan, Senior Director of Regulatory & Technical Affairs, American Chemistry Council (ACC)
74	EPA-HQ-OPPT-2018-0604-0074	David Michaels, Department of Environmental and Occupational Health, The George Washington University
75	EPA-HQ-OPPT-2018-0604-0075	Gary E. Timm, Environmental Protection Network (EPN)
76	EPA-HQ-OPPT-2018-0604-0076	Jennifer Sass, Natural Resources Defense Council (NRDC)
77	EPA-HQ-OPPT-2018-0604-0077	Georges C. Benjamin, Executive Director, American Public Health Association (APHA)
78	EPA-HQ-OPPT-2018-0604-0078	Jonathan Kalmuss-Katz, Staff Attorney, Earthjustice et al.
79	EPA-HQ-OPPT-2018-0604-0079	Suzanne Hartigan, Senior Director, Regulatory and Technical Affairs, American Chemistry Council (ACC)
80	EPA-HQ-OPPT-2018-0604-0080	Michelle Roos, Environmental Protection Network (EPN)
81	EPA-HQ-OPPT-2018-0604-0081	Swati Rayasam et al., Science Associate, Program on Reproductive Health and the Environment, Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco (UCSF PRHE)
82	EPA-HQ-OPPT-2018-0604-0082	Natural Resources Defense Council (NRDC) and Safer Chemicals Healthy Families (SCHF)
SACC	N/A	Science Advisory Committee on Chemicals (SACC)
Comments Received During Public Comment Period Ending on 12/19/2020		
105	EPA-HQ-OPPT-2018-0604-0105 EPA-HQ-OPPT-2018-0604-0103	David Wawer, Executive Director, Color Pigments Manufacturers Association, Inc. (CPMA)

#	Docket File	Submitter
106	EPA-HQ-OPPT-2018-0604-0106	Jared Rothstein, Society of Chemical Manufacturers & Affiliates (SOCMA)
108	EPA-HQ-OPPT-2018-0604-0108	Julia M. Rege, Vice President, Energy & Environment, Alliance for Automotive Innovation
109	EPA-HQ-OPPT-2018-0604-0109	Riaz Zaman, Counsel, Government Affairs, American Coatings Association (ACA)
110	EPA-HQ-OPPT-2018-0604-0110	Liz Hitchcock, Director, Safer Chemicals Healthy Families (SCHF) & National Resources Defense Council (NRDC)
111	EPA-HQ-OPPT-2018-0604-0111	Swati Rayasam, et al., Program on Reproductive Health and the Environment Department of Obstetrics, Gynecology and Reproductive Sciences University of California, San Francisco
112	EPA-HQ-OPPT-2018-0604-0112	Suzanne Hartigan, American Chemistry Council (ACC)
113	EPA-HQ-OPPT-2018-0604-0113	Michelle Roos, Environmental Protection Network (EPN)
119	EPA-HQ-OPPT-2018-0604-0119	Richard A. Denison, Environmental Defense Fund (EDF)
120	EPA-HQ-OPPT-2018-0604-0120	Brett Fox, International Union, UAW
121	EPA-HQ-OPPT-2018-0604-0121	Jen Jackson, Toxics Reduction & Healthy Ecosystems Program Manager, San Francisco Department of the Environment

(S) = Supplemental documents were provided with the comment and included in the summary

Overall Content, Organization, and Presentation of the Draft Risk Evaluation

Charge Question 1: Please comment on the overall content, organization, and presentation of the draft risk evaluation of PV29. Please provide suggestions for improving the clarity and transparency of the information presented in the documents.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
Draft was sufficiently clear and transparent		
8, 17	PUBLIC COMMENTS: EPA's draft risk evaluation for PV29 is transparent in areas where the evaluation diverged from the problem formulation document, and in most cases, provided reasoning for changes. EPA clearly indicates that the conditions of use have been modified slightly since the problem formulation phase of the assessment.	These organizational comments are appreciated and were considered in the final risk evaluation.
Need to improve clarity, transparency, and organization of rationale and conclusions		
SACC, 8, 17	SACC COMMENTS: Carefully review and revise the Evaluation to ensure a logical and coherent flow to the discussion and to ensure that justifications are near their associated conclusions. The Committee noted that throughout the document, conclusions are stated without referencing the appropriate source or analysis that supports it. Sometimes these conclusions occur due to how the Evaluation is organized, forcing the reader to search a later part of the document or an entirely different document for the justification of the conclusion. An example of this occurs in Section 2.4.2 Conceptual Models (page 14) that assumes that PV29 has low hazard and limited exposures (a conclusion) to justify the model before hazard (Section 3) and exposure (Section 4) have been discussed. Clearly state preliminary suppositions in the final risk determination and ensure that the hazard statement	These organizational comments are appreciated and were considered in the final risk evaluation. EPA has updated the risk evaluation and determination format for increased clarity regarding the unreasonable risk determination and the risk considerations for each condition of use. While EPA believes that discussions of the rationale for the determination of unreasonable risk are outside the scope of the SACC, EPA is committed to providing the public with sufficient information on the basis for that determination. TSCA requires EPA to determine whether chemicals in the marketplace present unreasonable risks to health or the environment. While the law does not specifically define this term, during the risk evaluation process EPA weighs a variety of factors including the effects of the chemical on human health or the environment, populations who are exposed (including any sensitive subpopulations), the severity of the hazard, and uncertainties. This approach is outlined in EPA's 2017

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	contains associated limitations and uncertainties. The Committee noted that there is information reported in EPA's Problem Formulation document that is referenced in the risk assessment. This information represents preliminary suppositions not discussed in a definitive manner in the Evaluation. Of most concern to the Committee were the preliminary suppositions that impacted Human Exposures (Section 3.3). The Committee concluded that broad statements such as "low hazard was reported for all routes of exposure in human health testing" did not adequately portray the associated uncertainty due to limited data and endpoints considered. The hazard statement at a minimum should identify the animal models and endpoints used. Define unreasonable risk under the TSCA legislative requirement and describe in general how the threshold between reasonable and unreasonable risk is determined. Consider using the slide presentation given by EPA on Thursday as a guide for organizing the draft risk assessment document. <u>PUBLIC COMMENTS:</u> At present, OPPT does not sufficiently describe its rationale for the conclusion of "no unreasonable risk" for PV29. While we support this determination, we have concerns about how this method will be applied to future chemical risk evaluations. We request that OPPT expand the narrative in the risk evaluation document to more clearly describe how the available information supports its findings.	*Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act* rule ("Risk Evaluation Rule") preamble on how risk evaluations will be conducted. [82 FR 33726, at 33735 (July 20, 2017)] Each risk evaluation details those factors and describes for the public which conditions of use were identified to have unreasonable risk for a chemical. For PV29, these factors included workplace exposures based on monitoring information from the sole U.S. manufacturer, Sun Chemical. When appropriate, in the risk evaluation, EPA considers exposure scenarios both with and without engineering controls and personal protective equipment (PPE). These assumptions are described in the risk characterization and risk determination sections of the final risk evaluation including uncertainties and their effect on the unreasonable risk determination for each condition of use. TSCA requires EPA to use reasonably available information and best available science in its risk evaluation. EPA identified uncertainties regarding the information that is reasonably available to characterize PV29's solubility and occupational worker inhalation exposure. These uncertainties resulted in EPA requiring testing of PV29 for use in the final risk evaluation under TSCA section 6(b). Test data has been reviewed for data quality and incorporated into the final risk evaluation.

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	EPA should consider making clear how it determined the existing data set was sufficient to develop a risk characterization and determination.	
Need to improve clarity and transparency of study quality evaluations		
17, 46	PUBLIC COMMENTS: More detail in the risk evaluation regarding how EPA evaluated study quality would improve transparency. EPA should always make study reviewer comments public in order for the public to understand the rationale behind its study quality scoring decisions and to have a transparent record of when and why changes to scores are made.	Along with publishing the problem formulation for PV29, EPA published a guidance document titled *Application of Systematic Review in TSCA Risk Evaluations* that describes the data quality criteria used for each discipline and outlines data integration strategies which are being used for the risk evaluations. EPA initially released the SR Supplemental File without the EPA reviewer's comments due to concerns that the comments might contain information claimed CBI. The revised draft and final risk evaluation increases transparency by inclusion of supplemental files that provide the details of the systematic review of all studies used.
Include measures and discussion of uncertainty and variability with numerical values		
SACC, 46	SACC COMMENTS: Include measures and discussion of uncertainty and variability with all numerical values. The SACC Committee noted that in the Evaluation, numerical values are presented without associated statements of confidence or measures of variability, especially the physical-chemical values. The Committee noted that risk assessments typically include discussions of uncertainty and variability with reported values. The scientifically reasoned basis for inclusion, exclusion or selection of data values is also expected. For example, is the indirect photodegradation half-life of 7 hours listed in Table 3-1 consistent with overall conclusions that the chemical is very persistent? Estimates of water solubility of PV29 are also inconsistent. PUBLIC COMMENTS:	EPA included further discussion of uncertainty surrounding the numerical values used in the final risk evaluation. Where applicable, the use of a particular value over another is explained and justified. EPA identified uncertainties regarding what information was reasonably available to characterize PV29's solubility and occupational worker inhalation exposure in the final risk evaluation. These uncertainties resulted in EPA requiring testing of PV29 to develop new information for EPA to decrease uncertainty in the final risk evaluation under TSCA section 6(b). EPA has added text to the final risk evaluation to identify data gaps in the information available for PV29 including human hazard information and particle size distribution information as well as dust exposure information for workers and processors.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	Major data gaps have not been acknowledged or addressed by EPA. EPA needs to forthrightly address the data gaps and uncertainties including those flagged by EU authorities.	
Need to improve transparency of risk evaluation process and procedures		
SACC, 8, 13, 17, 49	SACC COMMENTS: Include a short history or basis on why PV29 was originally selected for inclusion on EPA's Work Plan and discuss how those concerns have been addressed in the assessment. The Committee felt that this section is important in establishing the justification for the risk evaluation and provides context and importance for the final risk determination. PUBLIC COMMENTS: Guidance documents that detail the internal processes and procedures for risk evaluation under TSCA should be generated and made publicly available. EPA's description of its approach to data integration in its draft risk evaluation for PV29 is severely lacking. EPA should provide more detail on the tiered approach used in this risk evaluation. This should include developing guidance detailing its tiered assessments process, especially on how EPA will conduct higher-tier assessments triggered by lower-tier outcomes. Recommend that EPA provide additional information regarding why a quantitative screening-level exposure assessment was added. EPA should clarify why PV29 was poorly characterized for the Work Plan, and how the lessons from that	The final risk evaluation describes the history of PV29 risk evaluation from problem formulation through draft, revised draft and final risk evaluations. EPA incorporated narratives explaining the concerns associated with worker exposure to dust particles. The final risk evaluation also describes the current understanding of the chemical's risks as a result of the full TSCA risk evaluation process. EPA has finalized and made publicly available a document *Application of Systematic Review in TSCA Risk Evaluations* to provide the public with continued transparency regarding how evaluates the scientific information. The final risk evaluation includes supplemental files that provided the detailed evaluation of data quality for each study used. EPA is not implementing a fixed approach concerning tiered risk evaluations as suggested by the commenter. As evidenced by the Risk Evaluations for each of the first 10 chemicals evaluated under TSCA, EPA is adopting a fit-for-purpose approach which makes the determination based on the reasonably available data characterizing the conditions of use, hazards and exposures. Information has been added to the final risk evaluation to substantiate why evaluation of risks associated with inhalation exposures to PV29 dust was added.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	characterization might inform EPA's prioritization process for the TSCA Active Inventory. The lack of transparency in this risk evaluation will create a precedent of making "no unreasonable risk" determinations based on proprietary information.	With regard to the comment pertaining to proprietary information, in all instances, non-CBI versions of the study reports were made available to the Agency and can now be accessed in the public docket.
Report would be improved by adding graphics, figures, and/or tables		
SACC	SACC COMMENTS: Develop a flowchart/decision tree to more adequately describe the risk evaluation. The Committee concluded that uncertainty in decisions could be more transparently communicated and evaluated using appropriate graphics. The Committee discussed decision tree diagrams as well as logic model diagrams. Such diagrams could be adapted to display associated confidence at each decision point in order to clarify overall confidence in the conclusion (see also discussion in Question 2). Describe in more and better detail the systematic review process (Section 2.5) and its results. The results of systematic review are discussed in prose where one or two diagrams would significantly improve the clarity and transparency of the process. Graphical and/or tabular summaries are needed of the number of abstracts, reports and manuscripts reviewed, and reports and manuscripts accepted and rejected and at what stage in the review process.	In response to these comments, EPA has integrated flow-charts outlining the various steps of the literature search and the number of references that were identified at each step of the literature search and screening processes in Section 1.5. These literature flow diagrams have also been incorporated into the other evaluations for the first 10 chemicals evaluated under TSCA. For additional information about how the literature search strategy for PV29 was conducted, please consult the document entitled, "*Strategy for conducting literature searches for Pigment Violet 29 (PV29): Supplemental document to the TSCA scope document*," available at: https://www.epa.gov/sites/production/files/2017-06/documents/pv29_lit_search_strategy_053017_0.pdf
Need to improve transparency of external review processes		
16(S), 17, 82	PUBLIC COMMENTS: Coordination with other federal agencies and other EPA program offices should be clearly described. The final Risk Evaluation should include all peer reviewer comments and how EPA responded to them.	EPA's discussions and consultation with other federal agencies and other EPA program offices are reflected in both the revised draft risk evaluation and the final risk evaluation. EPA does not share internal deliberative comments from the interagency review process.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	EPA did not provide any means for the public to know about and have confidence in the extent of EPA CBI reviews, the determinations being reached, and the provision of access to information the law requires be provided.	All EPA responses to SACC recommendations are provided in this Response to Comment document. A final report of the proceedings of the TSCA Scientific Advisory Committee on Chemicals (SACC) meeting held on June 18-21, 2019 has been made publicly available in the docket (EPA-HQ-OPPT-2018-0604). The Letter Peer Review report on the revised draft risk evaluation is available at EPA-HQ-OPPT-2018-0604-0107 and the comments are provided as part of this Response to Comment (RTC) document. In all instances, non-CBI versions of study reports were made available to the Agency and were added to the public docket. The revised draft and final risk evaluation increases transparency by inclusion of supplemental files that provide the details of the systematic review of all studies used.
Need to improve access to information sources		
SACC, 13, 17	SACC COMMENTS: Provide cross references to relevant documents and associated information. The Committee understood that in order to keep the Evaluation relatively short and concise, EPA chose to not repeat information available in other documents or information sources, primarily other EPA documents that provide relevant guidelines. To assist the reader, the risk evaluation document should provide easy reference, and, where possible, internet links to these key documents or information sources. For example, reviewing the section on "environmental release and exposure," a reader should be able to click on a link to relevant EPA guidance documents on this topic. The SACC noted that recent TSCA legislation established that public review of (including access to) supporting data is part of the process ensuring transparency in the evaluation of health risk from large quantity manufactured chemicals in the US. All documentation and studies used for the	EPA has made every effort to update the revised draft and final risk evaluation to provide links to accommodate easier access to all publicly available information, data and guidance referenced in the risk evaluation. This includes Safety Data Sheets, information received from manufacturing stakeholders and full study reports. EPA has included copies of the Safety Data Sheets (SDSs) as well as information received via correspondence with manufacturing stakeholders that contain data used to characterize occupational and environmental exposures to PV29. These data are available in a supplemental file in the docket for the final Risk Evaluation entitled, "*Supplemental File: Information Received from Manufacturing Stakeholders*." (U.S. EPA, 2020a) EPA has worked with the data owners of the studies summarized in the ECHA database and has included fully

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	assessment, especially health and safety information, should be made available to the public. Access to certified CBI is still problematic. PUBLIC COMMENTS: EPA needs to link directly to the Safety Data Sheets (SDSs) used in reviewing engineering controls and PPE, or directly provide them. EPA should provide access to the SDS and industry statements on which it relies to discount potentially relevant routes of exposure. Sun Chemical's SDS is not available to the public; without this SDS, it is not possible to assess the accuracy of EPA's claims regarding engineering controls and PPE. Most information obtained from industry should have been made public, particularly the approximate maximum workplace air concentration and daily discharge rate from Sun Chemical. EPA must immediately make public the details of the Mott 2017 personal communication, and all other personal communications relevant to the risk evaluation. The exposure sampling data and detailed information should be available for public review so that commenters can provide their own interpretations to the docket. The public should not have to rely on the judgment of the manufacturer and the Agency that this is indeed the maximum exposure level. EPA should consider more clearly linking the robust study summaries available on ECHA's website to the	unredacted or partially redacted versions of these studies in the public docket for PV29 (EPA-HQ-OPPT-2018-0604). A summary of the redaction status of each study report can be found at https://www.regulations.gov/document?D=EPA-HQ-OPPT-2018-0604-0021. The inclusion of the full study reports increases the transparency of the Risk Evaluation process as it relates to PV29. The revised draft and final risk evaluation increases transparency by inclusion of supplemental files that provide the details of the systematic review of all studies used.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	outcome of the risk evaluation, to enhance clarity in how the data were applied.	
Need to improve transparency of occupational exposure data and PV29 uses		
SACC, 13, 15, 16, 17, 18	SACC COMMENTS: Include more information on production volume and derivative products. The Committee discussed the need for better discussion of PV29 production volume in the report. Missing was a discussion of how the quantity of PV29 produced makes this a high production volume chemical, or how the quantity produced relates to production volumes of other priority chemicals or high production chemicals. The Evaluation reports that 90% of PV29 production is used to make another pigment. This, combined with the observation that the European Union (EU) is assessing risks of both pigments together, suggested that the assessment should discuss both pigments in a single assessment. Needed is the rationale for why EPA has chosen to assess PV29 alone. The Committee would have also liked a summary/comparison of the structure, toxicity concerns, and exposure profiles for both chemicals. PUBLIC COMMENTS: EPA does not detail the efforts it made to research all reported PV29 uses and explain why uses it initially identified were dropped. EPA should provide information on how it determines what conditions of use are in/out of scope. This draft risk evaluation on PV29 is incomplete and not transparent about the information it relied on to assess health risk to working people.	As indicated above, EPA has included a narrative explaining the inclusion of PV29 on the TSCA Work Plan. Included in this narrative is an explanation of how the total production volume of the chemical relates to the current understanding of the conditions of use. In particular, the vast majority of overall production volume is consumed at the manufacturing site as an intermediate for the production of other pigments. EPA also notes that production volume of this chemical, ~600,000 lbs. in 2015, falls well below the threshold for a high production volume chemical which EPA considers to be 1,000,000 lbs; therefore, a discussion of PV29 being a high production volume chemical is not warranted. The risks of another pigment produced using Pigment Violet 29 as an intermediate is outside the scope of this risk evaluation. This chemical, if identified to meet the criteria for assessment through the prioritization would be considered in its own risk evaluation. PV29 was included in the prioritization list without other perylene pigments because information specific to PV29 was identified during the prioritization process that indicated that it was potentially hazardous to aquatic organisms. As explained in Section 1 of the final Risk Evaluation, review of the data led EPA to conclude that these aquatic toxicity data as well as other data used in the prioritization process are no longer applicable to C.I. Pigment Violet 29. Regarding the decision to assess PV29 alone, EPA incorporated a narrative explaining the basis for the inclusion of PV29 on the 2012 Work Plan in the Introduction (Section 1) of the final Risk Evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
		A list of "other uses" was compiled during EPA's initial search for PV29 conditions of use. This list of other uses included the following: Applications in odor agents, cleaning/washing agents, surface treatment, absorbents and adsorbents, laboratory chemicals, light-harvesting materials, transistors, molecular switches, solar cells, optoelectronic devices, paper, architectural uses, polyester fibers, adhesion, motors, generators, vehicle components, sporting goods, appliances, agricultural equipment and oil and gas pipelines (EPA-HQ-OPPT-2016-0725-0004). However, no further evidence was found or submitted during the scope, problem formulation and draft risk evaluation steps to support these "other uses" as intended, known, or reasonably foreseen conditions of use for C.I. Pigment Violet 29. As a result, these uses were determined to not be intended, known, or reasonably foreseen conditions of use. As stated in C.I. Pigment Violet 29's Problem Formulation, to determine the current conditions of use of C.I. Pigment Violet 29 and inversely, activities that do not qualify as conditions of use, EPA conducted extensive research and outreach. This included EPA's review of published literature and online databases including the most recent data available from EPA's Chemical Data Reporting program (CDR) and Safety Data Sheets (SDSs). EPA also conducted online research by reviewing company websites of potential manufacturers, importers, distributors, retailers, or other users of C.I. Pigment Violet 29 and queried government and commercial trade databases. EPA also received comments on the Scope of the Risk Evaluation for Pigment Violet 29 (U.S. EPA, 2017) that were used to determine the current conditions of use. In addition, EPA convened meetings with companies, industry groups, chemical users, states, environmental groups, and other stakeholders to aid in identifying conditions of use and verifying conditions of use identified by EPA.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
		TSCA Section 3(4) grants EPA the authority to determine what constitutes a condition of use for a particular chemical substance. In the case of PV29, as described in the preceding response, there were a group of "other uses" that were identified early in the process with poor quality references. Subsequent to the publication of the scope document, no further information was found or received by EPA that substantiated any of the uses with limited and poor-quality references that had been characterized as "other uses." As a result, these uses were determined to not be intended, known, or reasonably foreseen and are not conditions of use. Following the publication of the Draft Risk Evaluation, EPA communicated with the manufacturing stakeholders to clarify the uncertainties indicated by the commenters related to a lack of information characterizing the full range of job tasks, chronic health/exposure studies, workplace air monitoring data across shifts and tasks, assumptions about volumes handled by downstream processors/users, and PPE assumptions. The results of this information gathering have been compiled and released to the docket in a supplement entitled, *Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a).
Need to improve clarity and transparency of study quality evaluations		
17, 46, 47	PUBLIC COMMENTS: More detail in the risk evaluation regarding how EPA evaluated study quality would improve transparency. EPA should always make study reviewer comments public in order for the public to understand the rationale behind its study quality scoring decisions and to have a transparent record of when and why changes to scores are made.	On April 4th, 2019, EPA released an updated version of the systematic review documents for the PV29 risk evaluation. The systematic review materials for PV29 were updated following the release of study reports to include the reviewers' comments and a reevaluation of several human health studies (EPA-HQ-OPPT-2018-0604-0040). These updated systematic review data quality evaluation results were also released as supplemental files to the revised draft and final risk evaluation. This enhances the transparency of the systematic review portion of the risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
EPA did not use its legal authority under TSCA to collect data, and it should		
13, 16, 18, 44, 75	PUBLIC COMMENTS: EPA did not use its full authority to collect the relevant toxicity and exposure data. EPA must consider "reasonably available" information, and thus EPA must use its authorities under TSCA 4 and 8 to obtain additional information, this includes relying on more than voluntary data submissions. EPA is still relying solely on "readily" available information, not all reasonably available information. Relying solely on voluntary requests for information, may result in limited, biased, inaccurate, or incomplete information on the chemicals. Rather than relying on voluntary requests for information which are often limited, biased, inaccurate, or incomplete (*e.g.*, submissions by Sun Chemical Corporation and Color Pigments Manufacturers Association), EPA should use its mandatory authorities to collect the relevant toxicity and exposure data, and reissue for public comment. Necessary information includes conditions of use, exposures, workplace monitoring, environmental releases, hazards, potentially exposed or susceptible subpopulations, ecotoxicity. [For specific data requests, see comment summary sections 4.5, 5.1, and 6.7.]	Uncertainties were identified in the draft risk evaluation regarding reasonably available information characterizing PV29's solubility and occupational inhalation exposure. To address these uncertainties and respond to comments received, EPA used its Test Order authority under TSCA section 4(a)(2) to require testing of PV29 to develop new information to increase certainty in the final risk evaluation. EPA required the following testing to be conducted for PV29: Solubility of PV29 in water Solubility of PV29 in octanol A workplace dust monitoring study of respirable particles not otherwise regulated, conducted according to the NIOSH 0600 guideline. Test data has been received and reviewed for data quality and incorporated into the final risk evaluation. More information about the Section 4 Test Order for PV29 can be found in the Section 4 Test Order docket (EPA-HQ-OPPT-2020-0070-0008).
Violation of TSCA by not releasing full studies due to CBI claims		
9, 11, 12, 13, 14, 16, 20, 44, 46,	PUBLIC COMMENTS: Failure to release the 24 CBI studies violates section 14 of TSCA, reflects a troubling lack of transparency, and will frustrate the ability of interested parties to review and submit comments on the science EPA cites to support its	On March 21, 2019, EPA released copies of the 24 study reports claimed as CBI to the public docket. Fifteen study reports were completely released without redactions, while nine reports remain partially CBI with certain information redacted. Consistent with Agency regulations concerning the review of

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
46(S), 48, 49, 55, 75, 76, 82	risk evaluation and to participate meaningfully in the peer review process. TSCA restrictions on disclosure of CBI do not apply to health and safety studies that are submitted for chemical substances which have been offered for commercial distribution [TSCA section 14(b)(2)]. TSCA defines "health and safety study" broadly. EPA should immediately release all of the full study reports to the public under TSCA 14b. Threats from industry cannot justify compromising the transparency that Congress required under TSCA section 14(b). Withholding the full study reports violates requirements of public notice and comment in section 6 of TSCA and hinders the peer review process. Providing summaries of study reports does not adequately meet these requirements. Only access to the full studies will allow a meaningful opportunity to comment whether the studies support EPA's claim that PV29 does not present unreasonable risk. It is ironic that EPA believes it can base regulatory decisions on PV29 on data that are unavailable to the public while taking a diametrically opposite position in its recent proposed rule purportedly promoting "transparency" in regulatory science. *Federal Register* 18768 (April 30, 2018). The heavy data redactions from the reproductive/developmental toxicity screening study are so extensive as to preclude the ability of the public to	confidential business information claims located at 40 CFR Part 2, Subpart B, the Agency, in December 2018, requested substantiation of the CBI claims from the affected businesses. Subsequently these entities provided responses to the substantiation request. In fifteen instances, the CBI claims associated with the study reports were removed in full by the data owners. In nine instances, the CBI claims were reduced in scope. For the reasons explained in the final confidentiality determination, EPA concluded that TSCA section 14 did not govern these studies and determined that the information redacted in the nine studies at issue is entitled to confidential treatment. The Agency made a final determination on the CBI claims. In all instances, these study reports were made available to the Agency and can now be accessed in the public docket (EPA-HQ-OPPT-2018-0604-0021). As a result of the release of this information, EPA re-evaluated the studies and updated the data evaluation scoring sheets based on public comments. These updated systematic review scoring sheets also contain the reviewer comments which were previously not included because of concerns about CBI status. The updated SR Supplemental File, available in the public docket for PV29 (EPA-HQ-OPPT-2018-0604), provides a more transparent approach than previously provided by including the metric scores, weighting, reviewer's comments and the study's overall score. The information provided in the public docket for PV29 enabled a meaningful opportunity to comment on the draft risk evaluation and was consistent with TSCA 26(j) and 40 CFR 702.51 provisions on public availability of information. EPA reviews confidentiality claims asserted for information that is reported to, or otherwise obtained by, EPA under TSCA in accordance with TSCA section 14(f) and (g). Confidentiality

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	have any confidence at all in EPA's many decisions in the draft risk evaluation that are based on it. EPA's indication that it will allow members of the SACC to review the 24 studies but deny access to the public only compounds this lack of transparency. EPA has not described the claims of confidentiality that would justify withholding all or parts of the PV29 health and safety studies. Under TSCA, the only portion of a health and safety study that can be treated as CBI is information "that discloses processes used in the manufacture or processing of a chemical substance." The studies available for PV29 are unlikely to contain this type of information. EPA should have reviewed all confidentiality claims asserted in at least approximately one-fourth of the information submissions it received.	claims asserted for business information that is not subject to a specific statutory review requirement are reviewed in accordance with 40 CFR 2.204(a).
Support for EPA's handling of CBI		
19, 45, 47, 72	PUBLIC COMMENTS: EPA is correct to protect the CBI status of health and safety studies that are voluntarily submitted. The language in TSCA section 14 does not require EPA to publish confidential health and safety studies. EPA determined correctly that studies owned by foreign companies submitted voluntarily to EPA qualify for CBI protection under FOIA, and that analysis under TSCA is inapplicable. However, EPA significantly overstates what is required of the Agency under TSCA section 14(b)(2) in its March 14, 2019, Final Confidentiality Determination letter. If Congress had intended to require EPA to disclose all	EPA made the full studies available to peer reviewers and included a list of the studies and their results in the docket in accordance with TSCA section 26(j) and 40 CFR 702.51. Data quality evaluations for each study are available in supplemental files to the final risk evaluation. As discussed above, following substantiation of the CBI claims from the affected businesses, EPA has released fully unredacted or partially redacted versions of all of the studies discussed in the in the public docket for PV29 (EPA-HQ-OPPT-2018-0604). The Agency does not intend to amend its 2019 final confidentiality determination.

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	information contained within or underlying health and safety studies, it would have used the word "shall" or "must." TSCA section 14(b)(1) provides that when confidential information is mixed with information that is not protected from disclosure, the confidential information does not lose its confidential status merely because it is contained within information that is otherwise disclosed. While the health and environmental results of a study can never be CBI, the underlying data that has commercial value can and should be protected from disclosure with EPA's discretion. EPA should amend its analysis and recognize that TSCA section 14 provides EPA with discretion to protect CBI. Publishing confidential product data, such as valuable health and safety studies, would discourage companies from voluntarily expending resources on expensive toxicology studies. EPA's practice of protecting CBI in health and safety studies is consistent with past EPA practices and other chemical regulatory agencies around the world, including ECHA. Robust study summaries, as defined in the REACH regulation, provide "sufficient information to make an independent assessment of the study minimizing the need to consult the full study report." The SACC independent review minimizes the need to publicly release full study reports and provides the public with additional basis for confidence in the studies.	

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
Update risk evaluation to reflect availability of studies that were previously redacted		
SACC	SACC COMMENTS: Update the Evaluation to reflect recent changes in CBI availability. The Committee noted that there had been significant changes to CBI redacted information upon which the Draft Risk Evaluation relied. These formerly redacted studies are now publicly available for review.	Data quality evaluations for each study are available in supplemental files to the final risk evaluation. As discussed above, following substantiation of the CBI claims from the affected businesses, EPA has released fully unredacted or partially redacted versions of all of the studies discussed in the in the public docket for PV29 (EPA-HQ-OPPT-2018-0604).
Include description of the ramifications of the final risk statement		
SACC	SACC COMMENTS: The Public needs to know that if a substance is determined to pose an "unreasonable risk," the Agency will address the identified risk(s) through a risk management process. At a minimum, reference should be made to Agency guidance on how this next step would proceed. Any finding of no unreasonable risk is tied to limitations of currently available data and uses, including industrial hygiene practices, then the Evaluation should so state. A finding of "no unreasonable risk" should not preclude additional review. Substantial changes in use of the substance under review, and/or the development of new data that alters substantially knowledge of chemical properties, exposures and or toxicity, will alter exposures, toxicity, and will ultimately alter the overall risk. The Committee expressed concerned that a finding of "no unreasonable risk" indicates to the public that nothing further will be done to evaluate or regulate the substance under review (in this case PV29). On the other hand, the prior designation of PV29 as a high priority chemical may suggest to many in the public that additional risk management measures will be enacted regardless of	The final Risk Evaluation was modified to include detailed risk determinations for each condition of use in order to improve the understanding of the final risk evaluation results and if any risk management activities will follow the evaluation. EPA has identified in the final risk evaluation any changes to risk determinations from the draft risk evaluation. TSCA section 6 requires EPA to make a determination that a chemical substance undergoing risk evaluation presents or does not present an unreasonable risk of injury to health or the environment, under the conditions of use. In carrying out section 6, EPA must take into consideration information "that is reasonably available to the Administrator." TSCA section 26(k). A determination that a condition of use of a chemical substance does not present an unreasonable risk of injury is a final agency action. See TSCA section 6(i). Federal preemption of certain State actions regarding that chemical substance would apply only to the hazards, exposures, risks, and uses or conditions of use of such chemical substance included in that final agency action. See TSCA section 18(c)(3).

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	outcome. Additional clarification would be helpful so that manufacturers, state regulators, and the public will understand how the risk assessment finding will impact their current and future activity related to this substance. This statement is needed to clarify report findings and increase transparency of EPA intent following the report finding.	

Systematic Review Approaches and Clarity

Charge Question 2.1: Please comment on the approaches and/or methods used to support and inform the gathering, screening, evaluation, and integration of information used in the draft risk evaluation of PV29 and the updated Pigment Violet 29 (81-33-4) Systematic Review: Supplemental File for the TSCA Risk Evaluation (Published April 17, 2019). Please also comment on the clarity of the information as presented related to systematic review and suggest improvements as it applies to PV29.

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
Need to describe the rationale for developing a systematic review method specific to TSCA		
SACC, 82	SACC COMMENTS: Describe clearly the rationale for developing a systematic review specific to TSCA risk evaluations. Describe clearly the rationale for the differences in the TSCA systematic review relative to other peer-reviewed systematic review approaches currently in use. PUBLIC COMMENTS: EPA was not forthcoming during the SACC meeting when queried as to why it chose to develop its own method of systematic review for TSCA.	EPA/OPPT's quality evaluation method was developed following identification and review of various published qualitative and quantitative scoring systems to inform EPA's specific fit-for-purpose tool. The development process involved reviewing various evaluation tools/frameworks (*e.g.*, OHAT Risk of Bias tool, CRED, etc.; see Appendix A of the *Application of Systematic Review in TSCA Risk Evaluations* document and references therein), as well as soliciting input from scientists based on their expert knowledge about evaluating various data/information sources specifically for risk assessment purposes. While EPA's/OPPT's systematic review process may differ from other procedures or guides, it was developed specifically for the TSCA risk evaluation process and included certain protocols and processes. Based on comments received and challenges experienced with EPA's/OPPT's process for the first round of risk evaluations, EPA is refining it systematic review process for added transparency and clarity. Additionally, the refinement process includes more detail, specificity, and data integration than previously applied as well as developing clearer, more transparent processes and practices to be applied in future risk evaluations.

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
Need to initiate an external peer review of the TSCA systematic review protocol		
SACC, 13, 16, 46, 48, 80, 82	SACC COMMENTS**:** As soon as practical have NAS conduct a peer review of the TSCA systematic review protocol. PUBLIC COMMENTS**:** EPA should immediately initiate an external, independent peer review of its TSCA systematic review protocol. Until external reviews are completed, EPA should not use the TSCA systematic review protocol.	An ad hoc committee of the National Academies of Sciences, Engineering, and Medicine is reviewing EPA's guidance document on *Application of Systematic Review in TSCA* [Toxic Substances and Control Act] Risk Evaluations (EPA 2018) and associated materials developed subsequent to its issuance. The committee will determine whether EPA's process is comprehensive, workable, objective, and transparent. Recommendations for enhancements to EPA's 2018 guidance document will be made. More information and details about the NAS review effort are available here: https://www.nationalacademies.org/our-work/review-of-epas-tsca-systematic-review-guidance-document
Need to develop, peer review, and publish systematic review protocols prior to conducting TSCA risk assessments		
SACC, 13, 43	SACC COMMENTS: Develop, peer review and publish SRs for substances undergoing TSCA risk assessment prior to conducting the actual risk assessment. PUBLIC COMMENTS**:** EPA failed to establish an upfront protocol for PV29, which violates a basic principle of systematic review under TSCA. Developing systematic review protocols for each chemical in advance reduces bias and ensures transparency in decision-making. Insufficient time is not an acceptable justification for EPA's failure to develop protocols. The systematic review protocols should be available and subject to public comment prior to initiating subsequent steps of the risk evaluation process.	Systematic review and evaluation of reasonably available data for a chemical substance forms a major part of the risk evaluation process. In the interest of meeting the statutory deadlines set forth under TSCA for the completion of the risk evaluations, the systematic review process was conducted as the risk evaluations were being developed. For future risk evaluations, EPA will work to implement procedures to identify and fill critical data deficiencies at the beginning of the risk assessment process. EPA's/OPPT's systematic review and data quality evaluation methods were developed in part by consulting various published qualitative and quantitative scoring systems. The development process involved reviewing various evaluation tools/frameworks (*e.g.*, OHAT Risk of Bias tool, CRED, etc.; see Appendix A of the *Application of Systematic Review in TSCA Risk Evaluations* document and references therein), as well as soliciting input from scientists based on their expert knowledge about evaluating various data/information sources specifically for risk assessment purposes. Based on

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
		comments received and challenges experienced with EPA's/OPPT's process for the first round of risk evaluations, EPA is revising it systematic review process for added transparency and clarity. Additionally, the revision process includes more detail, specificity, and data integration than previously applied as well as developing clearer, more transparent protocols and practices to be applied in future risk evaluation processes.
Concerns that the TSCA systematic review method does not follow best scientific practices and should be replaced		
9, 13, 14, 16, 18, 43, 44, 46, 48, 55, 80	PUBLIC COMMENTS: The TSCA systematic review method does not follow best scientific practices for systematic reviews. Another example is that EPA has adopted a rigid, numerical scoring approach with weighted metrics to grade the quality of studies while other systematic review systems holistically evaluate and compare different studies and data sources, without relying on numeric scores. The National Academy of Sciences has cautioned against the use of scores in systematic review. The TSCA approach focuses on one limited aspect of systematic review, study quality, but fails to address other critical elements that the Agency itself recognizes are essential for science-based risk judgments, such as identifying and evaluating each stream of evidence and integrating evidence as necessary and appropriate based on strengths, limitations, and relevance. EPA should use a peer-reviewed, validated systematic review method for chemical evaluations instead of the TSCA method even if that delays development and completion of some risk evaluations. Examples include the NTP Handbook for Conducting a Literature-Based Health	EPA will work with the National Academy of Sciences, Engineering, and Medicine (NASEM) TSCA Committee to consider revisions to the data quality evaluation criteria and options regarding integrating evidence within and across evidence streams (human, animal, mechanistic data). EPA proposes to use a more structured framework for evidence integration for the next set of chemicals evaluated under TSCA. Appendix A of the *Application of Systematic Review in TSCA Risk Evaluations* explains the basis for EPA's/OPPT's development of a numerical scoring system to inform the characterization of the data/information sources during the data integration phase. The intent is to provide transparency and consistency to the evaluation process along with creating evaluation strategies that meet the TSCA science standards for various data/information streams. EPA's/OPPT's quality evaluation method was developed following identification and review of various published qualitative and quantitative scoring systems to inform our own fit-for-purpose tool. The development process involved reviewing various evaluation tools/frameworks (*e.g.*, NTP's Office of Health Assessment and Translation (OHAT) Risk of Bias tool, Criteria for Reporting and Evaluating Ecotoxicity Data (CRED), etc.; see Table 1 and Appendix A of the *Application of Systematic*

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
	Assessment Using OHAT Approach for Systematic Review and Evidence Integration; the EPA Handbook for Developing IRIS Assessments; the Preamble to the IARC Monographs; and the Navigation Guide Systematic Review Method (Woodruff and Sutton, 2014). Unlike the aforementioned approaches to systematic review, the TSCA protocol fails to address the steps TSCA risk evaluations will take to determine the strengths and relevance of individual studies, group them into streams of evidence and integrate these streams into a set of judgments about the weight of the evidence as a whole.	*Review in TSCA Risk Evaluations* and references therein), as well as soliciting input from scientists based on their expert knowledge about evaluating various data/information sources for risk assessment purposes. While there are many published systematic review tools available for human health and environmental health hazard assessment, no systematic review tools were identified that encompass either exposure assessment (*e.g.*, general population exposures, occupational exposures and industrial releases) or fate and transport assessment. In order to ascertain the quality of the available data, EPA/OPPT used a numerical scoring system to assign a qualitative rating. The goal of this approach was to add consistency and transparency to the evaluation process. Scores were used for the purpose of assigning the confidence level rating of High, Medium, Low, or Unacceptable, and informed the characterization of data/information sources during the data integration phase. The data quality evaluation results for the first ten TSCA Risk Evaluations are posted on chemical specific websites (see Table 1). In all evaluation strategies, professional judgment was employed to determine the adequacy or appropriateness of the qualitative rating assigned by the numerical scoring system. The TSCA evaluation strategies consider methodological design and implementation and reporting within the existing domains and metrics. Since it is difficult to have high confidence in data where the underlying methods are unreported or poorly reported, EPA assesses reporting and methodological quality simultaneously. However, EPA recognizes the challenge of discerning between a deficit in reporting and a problem in the underlying methodological quality of the data/information source. Developing a

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		reporting checklist, guidance document or a separate reporting quality domain may be a future solution for consideration in optimizing the evaluation strategies. EPA also designed evaluation criteria that consider risk of bias and Bradford Hill aspects when assessing the quality of animal toxicity and epidemiological studies. Refer to Appendices F, G and H of the *Application of Systematic Review in TSCA Risk Evaluations* for more information. EPA will consider other existing approaches as part of the process of developing the methods and/or approaches for integrating exposure and hazard evidence supporting the TSCA risk evaluations. Due to the variety of chemicals being evaluated under TSCA, EPA expects variations in the integration methods and/or approaches across different evidence streams as part of the process of developing fit-for-purpose risk evaluations that meet the TSCA science standards.
Need to more clearly describe the systematic review protocol and procedures		
SACC	SACC COMMENTS: Describe clearly the explicit populations, exposures, comparators, and operators (PECO or problem formulation) used in the systematic review. Describe clearly how the TSCA systematic review is updated and describe the rationale for decisions applied in the systematic review for specific substances.	According to the *Application of Systematic Review in TSCA Risk Evaluations* (U.S. EPA, 2018a), systematic reviews typically describe the study eligibility criteria in the form of PECO statements or a modified framework. PECO stands for Population, Exposure, Comparator and Outcome. The approach is used to formulate explicit and detailed criteria about those characteristics in the publication that should be present in order to be eligible for inclusion in the review (*e.g.*, inclusion of studies reporting on the effects of chemical exposure to potentially exposed or susceptible subpopulations). EPA developed PECO statements to guide the screening of the environmental and human health hazard data or information sources for each of the TSCA risk evaluations.

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		However similar guides for screening were developed for data and information of different disciplines using generic RESO and PESO statements. In the case of C.I. Pigment Violet 29, EPA did not exclude and populations, exposures, comparators or operators during the data search and screening process for C.I. Pigment Violet 29. Various PECO or PECO equivalent documents have been created to document the eligibility criteria for various data or information streams informing the TSCA risk evaluations: physical chemical properties; environmental fate and transport; engineering and occupational exposure; exposure to the environment, the general population and consumers; and environmental and human health hazards. It is important to mention that PECO/RESO/PESO statements can be modified once they are drafted and implemented, through a calibration process. Calibration is when screeners jointly screen 10-40 studies to identify points of confusion or chemical-specific considerations. More information about the use of specific populations used in the systematic review of PV29 are outlined in the *Application of Systematic Review in TSCA Risk Evaluations* available at: https://www.epa.gov/sites/production/files/2018-06/documents/final_application_of_sr_in_tsca_05-31-18.pdf EPA anticipates feedback from the NAS on its systematic review process and will carefully review and implement relevant NAS recommendations, as appropriate.
Need to provide a more thorough discussion of data integration		
SACC, 8, 13,	SACC COMMENTS:	EPA appreciates the comments and is currently in the process of updating its Systematic Review protocol. In

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
48, 55	Include a more thorough and inclusive data integration discussion in the TSCA systematic review for PV29. The discussion should include descriptions of how the human health experience, mechanistic information, in vitro data, and controlled laboratory animal data are used to support conclusions. Include in the discussion how chemical structural considerations, read across, and other information including findings from New Approach Methodologies (NAMs), add to the evidence for potential PV29 toxicity. The discussion should also address data uncertainties. PUBLIC COMMENTS: The TSCA systematic review protocol does not include methods for evidence synthesis and integration as required by EPA regulation under TSCA. The draft risk evaluation simply states that "EPA analyzed and synthesized" available evidence, without specifying its strategy for data integration. The discussion does not detail how individual study scores were used in this step of the review process for PV29. EPA should describe its general approach to evidence integration, referring to established systematic review approaches. If OPPT relied directly on SAR evaluations or other data used in international agency assessments of PV29, OPPT should indicate this and describe how the other evaluations were evaluated to determine their robustness.	addition, EPA is seeking feedback from the National Academies of Science (NAS) on its Systematic Review process, including data evaluation criteria and data quality rating methods used in TSCA Risk Evaluations. The NAS webinars occurred from June through August, 2020. EPA will consider all comments and feedback received in updating its Protocol. In response to comments, EPA has made several editorial changes in multiple sections within the final Risk Evaluation document to increase the transparency of its systematic review process and methodologies used. In addition to the data evaluation criteria published in the *Application of Systematic Review in TSCA Risk Evaluations*, EPA has updated the systematic review components of the final risk evaluation which revises or adds data quality evaluation reviews for all available data for human health, environmental hazard, environmental fate, physical chemical property data, environmental release occupational exposure data quality evaluation reviews in the assessment. The updated systematic review scoring sheets, released on April 17, 2019 (EPA-HQ-OPPT-2018-0604-0040) with updated data quality evaluation scores and reviewer comments, are reflected in Systematic Review Companion Documents released with the final risk evaluation. EPA is developing and implementing more formal and structured data integration, analysis and synthesis strategies for the next set of TSCA chemical risk evaluations. Where EPA utilized SAR tools in its assessment, EPA evaluated these tools for data quality. The results of the data quality evaluation of the EPIsuite™ modeling program is available in the supplemental file, *Systematic Review Supplemental File: Data Quality Evaluation of*

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
		Environmental Fate and Transport Studies" (U.S. EPA, 2020b)
Insufficient data concerns and handling of lack of data		
SACC, 10, 12, 13, 15, 16, 18, 44, 46, 49, 82	SACC COMMENTS: Discuss why an "indeterminate" designation is not needed in the TSCA systematic review to account for situations where there is significant lack of data. Improve the discussion on why available study data are adequate to reach the conclusions of "no *unreasonable* risk" from exposure to PV29. This discussion should also justify why additional testing is not necessary to confirm this conclusion. PUBLIC COMMENTS: The systematic review did not gather all appropriate data and EPA should use its authorities under TSCA to obtain additional information. The updated study quality scores for the two BASF acute inhalation toxicity studies as Unacceptable further highlights the lack of sufficient information available to evaluate PV29's risks. EPA did not include a review of, or reference to, a 90-day repeated dose dietary study in rats that also is in the REACH database for this chemical.	In response to uncertainties resulting from lack of data identified in public and SACC comments, as well as in the risk evaluation, EPA issued a TSCA Section 4(a)(2) Test Order for PV29 on February 28, 2020. The Test Order was issued to the one U.S. manufacturer, Sun Chemical Corporation, and one U.S. importer, BASF, and required the generation and submission of three studies to address critical data gaps identified in the risk evaluation. More information about the Section 4 Test Order for PV29 can be found in the docket (EPA-HQ-OPPT-2020-0070-0008). EPA is currently developing a procedure to identify data deficiencies earlier in the risk evaluation process so an indeterminate designation is not necessary. As indicated above, EPA issued a TSCA Section 4(a)(2) Test Order for PV29 on February 28, 2020 to the one U.S. manufacturer, Sun Chemical Corporation, and one U.S. importer, BASF, that required the generation and submission of three studies to address critical data gaps identified in the risk evaluation. More information on this Test Order can be found on its docket (EPA-HQ-OPPT-2020-0070-0008). In the absence of reasonably available data to characterize inhalation toxicity of PV29, EPA has used analogue toxicity data to characterize the risks to human health from occupational exposure to PV29. EPA did not identify a US data owner for these studies. As the full study reports could not be obtained for these study summaries, EPA did not utilize the results in the assessment,

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		although they appeared to be consistent with the Reproduction/ Developmental Toxicity Screening Test discussed in the assessment.
Concerns about the quality of the body of evidence for PV29		
43, 47, 48, 55	PUBLIC COMMENTS: Applying the Navigation Guide risk of bias tool to the 15 PV29 animal toxicity studies indicates that the overall quality of the body of evidence is low. Based on the partial disclosure of reports of the 24 PV29 studies, the limitations and deficiencies of these studies in assessing PV29's acute and chronic health effects have been further demonstrated, providing more evidence that EPA's lacks any justification for its conclusion that PV29 "presents a low hazard to human health across all routes of exposure."	All studies and information used in the final risk evaluation, including those submitted through correspondences with manufacturing stakeholders of PV29, are evaluated using the same data quality criteria under the TSCA Systematic Review process described in the document, *Application of Systematic Review in TSCA Risk Evaluations*. In consideration of comments received, EPA is in the process of updating the TSCA Systematic Review protocol to improve the transparency of this review process and further reduce possible bias such that all studies are appropriately considered. As indicated in the final risk evaluation, EPA issued a TSCA Section 4(a)(2) Test Order for C.I. Pigment Violet 29 on February 28, 2020. This test order compelled the creation and submission of three studies by the sole US manufacturer of PV29, Sun Chemical, as well as BASF, an importer of PV29 to address critical data gaps identified in the risk evaluation. In an effort to increase transparency, EPA has released all data that were used to conduct the final risk evaluation, with some redactions for CBI. CBI in several study reports prevented the release of fully unredacted versions of these studies. Fully unredacted versions of these studies were made available to the SACC members and their input on the quality of the studies and the effect of the remaining redactions on the ability of the general public to interpret the studies was recorded in the *Transmittal of Meeting Minutes and Final Report for the TSCA Science Advisory Committee on Chemicals Meeting Held June 18-21, 2019*, which was made available in the public docket for PV29 (EPA-HQ-

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		OPPT-2018-0604-0089).
Concerns relating to the personal communication from Sun Chemical		
SACC, 12, 13, 14, 15, 16, 17	SACC COMMENTS: Perform a quality assessment of the exposure data for occupational exposures to PV29 that was provided to the Agency as a personal communication from the manufacturer of PV29. PUBLIC COMMENTS: EPA's characterization of human health risk is based on the suspect and undocumented workplace exposure estimates privately provided to EPA by the chemical's manufacturer. EPA heavily and inappropriately relied upon unsubstantiated industry correspondence to inform its exposure analysis, but this correspondence was exempted from quality review under its systematic review approach. The Sun Chemical Corporation communication as reported by EPA fails to meet the minimal requirements for poor quality data, and it should be classified as unacceptable. This personal communication does not constitute the "best available science" showing worker exposures and it does not meet the scientific standards of industrial hygiene. Therefore, it cannot reasonably form the basis of EPA's conclusion that PV29 does not pose an unreasonable risk to workers. If EPA receives data from a manufacturer, the data should be reviewed for accuracy, quality, relevancy and suitability. EPA should specify how it evaluated these sources for PV29.	As part of the final risk evaluation, EPA has conducted a data quality evaluation for all environmental release and occupational exposure data received for PV29 through correspondences with manufacturing stakeholders and has made this information publicly available in the companion document to the final Risk Evaluation titled, "*Supplemental File: Information Received from Manufacturing Stakeholders*." In cases where data were insufficient or inadequate to meet the minimum validity criteria, EPA has made efforts to clarify the information. In the case of occupational exposure data, EPA compelled the creation and submission of a workplace monitoring study of respirable particles not otherwise regulated, conducted according to the NIOSH 0600 by the sole US manufacturer of PV29, Sun Chemical, as well as BASF, an importer of PV29.

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Need for public access to data		
SACC, 13, 46	SACC COMMENTS: Ensure that Confidential Business Information (CBI) requirements do not prevent important health-based data from being made available to the public. PUBLIC COMMENTS: Systematic review practices require access to full studies. The lack of study detail in the study summaries calls into question EPA's ability to reliably evaluate study quality. EPA should make such information public and easily searchable through online portals such as the Health and Environmental Research Online (HERO) database.	The systematic review materials for PV29 were updated following the release of study reports to include the reviewer's comments and a reevaluation of several human health studies (EPA-HQ-OPPT-2018-0604-0040). These updated systematic review data quality evaluation results are included as supplemental documents to the final risk evaluation and enhances the transparency of the systematic review portion of the final risk evaluation.
Study quality evaluation and scoring concerns		
SACC, 8, 13, 16, 17, 43, 46, 47, 48, 55	SACC COMMENTS: Describe clearly the justification for using a weighted scoring system and the rationale for the metrics selected for differential weighting in its evaluation of studies. Provide additional rationale to the TSCA systematic review justifying NR codes for certain metrics that are not typical of animal studies and improve discussions on how an NR code impacts the quality score. Include data quality criteria in the TSCA systematic review for evaluating personal communications and other information types not already identified in the TSCA systematic review that might be considered critical in a risk evaluation. PUBLIC COMMENTS: The numerical scoring approach was not effective for evaluating study flaws. Overall scores can mask flaws that	Appendix A of the *Application of Systematic Review in TSCA Risk Evaluations* explains the basis for EPA's/OPPT's development of a numerical scoring system to inform the characterization of the data/information sources during the data integration phase. The intent is to provide transparency and consistency to the evaluation process along with creating evaluation strategies that meet the TSCA science standards for various data/information streams. EPA's/OPPT's quality evaluation method was developed following identification and review of various published qualitative and quantitative scoring systems to inform our own fit-for-purpose tool. The development process involved reviewing various evaluation tools/frameworks (*e.g.*, NTP's Office of Health Assessment and Translation (OHAT) Risk of Bias tool, Criteria for Reporting and Evaluating Ecotoxicity Data (CRED), etc.; see Table 1 and Appendix A of the Application of Systematic Review in TSCA Risk Evaluations and references therein), as well as soliciting

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	might otherwise cause a study's conclusions to be questioned. The scoring system could result in many studies being arbitrarily classified as "poor" or "unacceptable" based on a small number of reporting or methodology limitations that do not negate their overall value for assessing health risks. The study quality scoring system is highly questionable in the absence of any external validation phase or thorough pilot testing. EPA should provide more explicit criteria and descriptions for the Not Rated/Applicable score determination. There were many changes in the study quality metric ratings for the animal toxicity studies between the initially released and updated systematic review documents. This suggests the criteria for the metrics are not clear and it reveals numerous inconsistencies and inaccuracies in the scoring sheets. It appears that different reviewers were used for the second round of scoring than the first, suggesting that the scores depend heavily on the subjective judgement of the reviewer. It seems that there was one reviewer for each study, although best scientific practice is to have two independent reviewers. The scoring sheets provide the quality scores but do not provide information regarding the rationale for scores. EPA should make the reviewer comments publicly	input from scientists based on their expert knowledge about evaluating various data/information sources for risk assessment purposes. While there are many published systematic review tools available for human health and environmental health hazard assessment, no systematic review tools were identified that encompass either exposure assessment (*e.g.,* general population exposures, occupational exposures and industrial releases) or fate and transport assessment. The data quality evaluation results published with each risk evaluation provides the lists of references EPA/OPPT evaluated for the first 10 TSCA risk evaluations. In order to ascertain the quality of the available data, EPA/OPPT used a numerical scoring system to assign a qualitative rating. The goal of this approach was to add consistency and transparency to the evaluation process. Scores were used for the purpose of assigning the confidence level rating of High, Medium, Low, or Unacceptable, and informed the characterization of data/information sources during the data integration phase. The data quality evaluation results for the first ten TSCA Risk Evaluations are posted on chemical specific websites. In all evaluation strategies, professional judgment was employed to determine the adequacy or appropriateness of the qualitative rating assigned by the numerical scoring system. The TSCA data evaluation strategies consider methodological design and implementation and reporting within the existing domains and metrics. Since it is difficult to have high confidence in data where the underlying methods are unreported or poorly reported, EPA assesses reporting and methodological quality simultaneously. However, EPA recognizes the challenge of discerning between a deficit in reporting and a problem in the

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	available or provide more detail on the rationales behind the scores. EPA should continue to update its systematic review guidance to provide greater clarity and transparency in regard to study quality criteria. It remains unclear how EPA will address the quality of more disparate study types that may be encountered for other chemistries. EPA must ensure that its scientists and contractors are appropriately trained and equipped and given the scientific independence to conduct robust evaluations of study quality. EPA had failed to empirically document the link between its scoring metrics and the overall value of a study in a holistic evaluation of risk.	underlying methodological quality of the data/information source. Developing a reporting checklist, guidance document or a separate reporting quality domain may be a future solution for consideration in optimizing the evaluation strategies. EPA also designed evaluation criteria that consider risk of bias and Bradford Hill aspects when assessing the quality of animal toxicity and epidemiological studies. Refer to Appendices F, G and H of the *Application of Systematic Review in TSCA Risk Evaluations* for more information. Relevant data sources are evaluated for data quality following title/abstract and full-text screenings, after a pilot period to calibrate criteria and revise as needed. Generally, each study evaluation is conducted by at least two reviewers, with a process for comparing and resolving differences. This helps ensure quality assurance. However, based on assessment needs, the assessment team should make decisions about how many reviewers are needed. While more than one reviewer is ideal, there may be times when one reviewer is acceptable, such as when the assessment needs to be conducted under a rapid timeframe and the outcome being reviewed is unlikely to be a driver for the assessment. These quality assurance methods are the same as used by EPA's IRIS Program. Other EPA Offices (such as Office of Research and Development and the Office of Science Coordination and Policy) partnered with OPPT in developing innovations in searching and screening for the next 20 chemical evaluations (see response to Q5) and continue to support OPPT in scoping and SR efforts. The data evaluation is conducted in a tool (*e.g.*, Excel, Access, DistillerSR) that tracks and records the evaluation for each data/information source including reviewer's

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		comments. EPA initially released the SR Supplemental File without the EPA reviewer's comments due to concerns that the comments might contain information claimed CBI. The Updated SR Supplemental File, released on April 4, 2019, now makes publicly available the EPA reviewer's comments related to the data quality evaluation of the physical chemical characteristics, environmental fate, environmental hazard and human health studies (EPA-HQ-OPPT-2018-0604-0040). EPA has made reviewer comments public as Supplemental Files released with the revised draft and final risk evaluation. This documentation increases the transparency of professional judgment calls to stakeholders and the public for the final risk evaluation for PV29. Use of an NR rating for a score is up to the scientific judgement of the reviewer. This rating should be applied when the metric or domain is not relevant to the scoring criteria. If this rating of NR is applied, then the metric is not counted towards the overall data quality evaluation score of the study.
TSCA systematic review method was effective for PV29		
8, 17, 19, 47	PUBLIC COMMENTS: EPA appropriately gathered and considered all of the available and relevant data for PV29. EPA's use of data generated for other regulatory programs is important and encouraged. EPA completed a thorough review to verify the quality of the submitted studies.	EPA acknowledges these comments.

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	ACC commends EPA on its approach to using inhalation exposure data provided by a manufacturer as a means to obtain useful data in an expedient manner. The updated systematic review increased transparency in regard to study quality evaluation and is a marked improvement over EPA's original PV29 systematic review document.	
Include discussion of toxicity of byproducts of manufacturing and impurities in PV29		
SACC, 12, 13, 46	SACC COMMENT: Include a discussion on the potential toxicity of byproducts of manufacturing and impurities in PV29. PUBLIC COMMENT: EPA did not review studies on chemical residuals of the PV29 manufacturing process. In the problem formulation, EPA identifies naphthalimide as a residual of PV29 as manufactured. Workers are potentially exposed to naphthalimide. EPA has dropped all mention of this chemical in the draft risk evaluation. EPA must conduct a much more extensive review of the extent of presence and the potential risks of naphthalimide in PV29 before reaching a decision to do no further analysis.	EPA's exclusion of naphthalimide impurities of reactions in the production of other chemicals from the scope of this risk evaluation is a policy decision. In exercising its discretion under section 6(b)(4)(D) to identify the conditions of use that EPA expects to consider in a risk evaluation, EPA believes it is important for the Agency to have the discretion to make reasonable, technically sound scoping decisions. EPA has added a discussion of chemical residuals of the PV29 manufacturing process to the final risk evaluation. In particular, Naphthalic acid/anhydride is considered to be a dermal and inhalation sensitizer. Risks are not quantified for the chemical residuals, but their presence is discussed in terms of increasing potential risks associated with the chemical of interest. Naphthalimide generated as a byproduct of the production of PV29 is outside the scope of this risk evaluation.

Physical Chemical Properties and Environmental Fate

Charge Question 3.a: Please comment on the characterization of Log Kow, Koc and bioaccumulation for PV29, including any suggestions for alternative sources or methods to obtain or derive better estimates of the properties (*e.g.*, use of specific analogs).

Charge Question 3.b: Please comment on characterization of the physical chemical properties of PV29, especially with regard to the determination by the European Chemicals Agency (ECHA) to include PV29 on the 2019-2021 Community Rolling Action Plan (CoRAP) update as a "suspected PBT/vPvB [Potentially Persistent, Bioaccumulative and Toxic/very Persistent and very Bioaccumulative substance]." The CoRAP justification document for PV29 is available at: https://echa.europa.eu/documents/10162/13628/corap_justification_201-344-6_226-866-1_be_12079_en.pdf/cf312ff9-6b18-8b76-bc66-d86320faa24a

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Concerns about water solubility study and value EPA used		
13, 45, 55, 78	PUBLIC COMMENTS: EPA did not explain why the water solubility value provided in the 2017 PV29 scoping document was discarded in the draft risk evaluation. The study used to determine water solubility failed to consider pH and its influence on water solubility. Measured values for relatively poorly soluble substances are highly uncertain. EPA used an incomplete data set and selected lowest solubility estimate available. While the water solubility estimate is higher than the actual measured solubility for PV29, it is still more than 10 times lower than the estimate provided in the CoRAP Justification Document. The CoRAP Justification Document failed to incorporate the output of the most recent EPA ECOSAR estimation	The structure of PV29 is unique. Not only does it have the chromophore to give its color, it is also entirely planar and has multiple hydrogen bonding groups to give it high stability. The highly symmetric nature of the structure allows for efficient molecular packing and strong intermolecular hydrogen bonding at both ends to give a closely packed herringbone or stair-step type manner. As a result, the substance has a very high melting point (> 500 deg C) for an organic substance and low water solubility. The value that was 16.9 times higher was inconsistent with the expected solubility due to its highly stable intermolecular structure. The value from EPI allows for the input of a melting point value. The standard protocol values EPA reports include the water solubility. The water solubility test guidelines call for testing the substance in deionized water and recording the pH of the test solution during the test. The study performed by BASF determined the pH to be 6 during the water solubility study. Also, it should be noted that PV29 was found to be insoluble

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	program. Studies provided in the ECHA dossier for PV29 reported higher solubility values.	in most solvents except for concentrated sulfuric acid which was used to perform the UV studies. Therefore, the substance is soluble under highly acidic conditions (though the exact value was not determined). EPA issued a TSCA Section 4 Test Order to require the sole manufacturer of PV29 to submit additional testing to measure the solubility of PV29 in water and octanol. The results of this testing are incorporated into the final risk evaluation. This testing was conducted with a modified protocol that accommodates the particular physical-chemical characteristics of PV29 (Nicolaou, 2020). The results of the solubility in water and solubility in octanol tests were determined to be high quality and are used support EPA's conclusion that PV29 is insoluble.
Remove statements that low aqueous solubility precludes oral bioavailability		
SACC	SACC COMMENTS: Remove statements that claim that an aqueous solubility of ≤ 11 µg/L precludes oral bioavailability.	EPA has updated the final risk evaluation to remove these statements.
Use alternative methods to generate information to evaluate bioavailability		
SACC	SACC COMMENTS: Use alternative property estimation methods to generate the additional information needed to strengthen the weight of evidence to conclude that PV29 is not bioavailable.	EPA has utilized several in-silico methods to strengthen the available body of evidence that discusses the bioavailability of PV29 where possible.
Concerns about use of EPI Suite™		
SACC, 13, 45	PUBLIC COMMENTS: EPA should clarify and address the appropriateness of using EPI Suite estimates in evaluating PV29's risks. EPA altered its prior characterization questioning the reliability of estimates derived using EPI (Estimation Programs Interface) Suite™.	EPA acknowledges the limitations of EPI Suite™ modeling to predict the solubility of PV29. The model limitations were taken into consideration when evaluating the results. In response to uncertainties about the quality of EPI predictions for PV29, EPA required the submission of water and octanol solubility data through the submission of a Section 4 Test Order.

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	Using modelled estimations for water solubility from EPI Suite is inconsistent with the REACH guidance. Significant problems remain with EPI Suite, but versions linked to the PBT Profiler were improved in their accuracy with respect to organic pigments. Models like EPI Suite historically have tended to predict a much higher solubility than experimental results determine for substances outside the calibration range of the models.	EPA required the development and submission of measured data to characterize the solubility of PV29 in water and octanol. While EPA chose to rely on the measured solubility data, a comparison with these values and the EPI-estimated solubility values (estimated to be 0.01 mg/L with an input of 400 deg C as the Melting Point and 0.001 mg/L with an input of 500 deg C) indicates that EPI-estimated values were higher than the measured values, but still indicates low water solubility.
Lack of clarity and data to support conclusions regarding bioaccumulation potential		
13, 16	PUBLIC COMMENTS: EPA did not indicate the methods used in deriving its BAF and BCF values. EPA relies on incomplete and uncertain data to conclude that PV29 does not bioaccumulate. The evidence for solubility and bio-accumulation potential is inconclusive.	The solubilities of PV29 in both water and Octanol were confirmed by EPA from recent studies submitted by Sun Corporation under the TSCA Section 4 order. Therefore, the BCF and BAF values calculated by EPI Suite using estimated Kow value will not be used in the final PV29 risk evaluation.
Supportive of conclusion that PV29 is poorly absorbed		
19, 45	PUBLIC COMMENTS: Based on physicochemical properties of PV29, EPA correctly classified PV29 as poorly absorbed by all routes of exposure. Measured values for octanol and water solubility using the ETAD method, which were submitted to ECHA under science-based guidance adopted by ECHA for assessments under REACH, and submitted to EPA for its Draft Risk Evaluation, accurately indicate that PV29 is not bioaccumulative.	EPA classified PV29 as poorly absorbed because of the low solubility and the relatively large molecular weight, which hinders absorption of PV29 as particles into the bloodstream by all routes of exposure. However, inhalation of PV29 as particles may result in the accumulation of the particles in the pulmonary system. PV29 is also reported by Sun Chemical Corporation to be present in the workplace at a particle size in the nanometer range. These particles can potentially migrate through tissues after inhalation and could be deposited into other tissues.
Ensure consistency or justify differences among physicochemical properties across the assessment		

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SACC	SACC COMMENTS: Ensure that the physical-chemical properties used throughout the Evaluation are consistent or note the reasons for discrepancies.	EPA has reviewed the physical chemical properties used throughout the document for consistency.
Consider metabolic pathway prediction software to identify intermediates		
SACC	SACC COMMENTS: Consider using metabolic pathway prediction software to look for potentially problematic intermediates for PV29. Despite the fact that PV29 seems to have minimal ready biodegradation, the production of toxic and persistent metabolites is always a concern especially for any compound having structure similar to PAHs. Develop and justify high-quality estimates for log K_{ow} or fat solubility to solidify the argument that PV29 is not bioavailable or likely to be absorbed into organisms or tissues. Improve the discussion supporting the importance of K_{oa} and better illustrate its implications on determinations of environmental distribution of PV29 and resulting exposure to humans and other organisms.	The lack of biodegradation and low solubility of PV29 in water and octanol means that the chemical is out of the bounds of the metabolic prediction software. In addition, PV29 is not expected to be metabolized due to low potential for absorption, so the production of metabolites is not expected. As discussed in the assessment, $LogK_{OW}$ is not a relevant property for PV29 because it demonstrates a low solubility in octanol and water and behaves more like an insoluble particle. As such, it is not expected to absorb into organisms or tissues. The exception may be deposition of particles in the respiratory system after inhalation. EPA issued a test rule Order under TSCA section 4(a)(2) requiring the Sun Chemical Corporation and BASF to conduct solubility testing for PV29. These tests were required to address the uncertainties identified by EPA and members of the Science Advisory Committee on Chemicals (SACC) regarding PV29's water and octanol solubility. EPA issued this test rule Order because, for an insoluble particulate substance such as PV29, the octanol and water solubility should be considered separately to give a useful estimate for the Log K_{ow} and an indication of its bioavailability. The Sun Chemical Corporation conducted these studies under protocols reviewed by EPA and based on OECD Test No. 105 for water solubility and the Ecological

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		and Toxicological Association of Dyes and Organic Pigments (ETAD) method for octanol solubility. The study results, which are available on regulations.gov at (EPA-HQ-OPPT-2020-0070-0008), were conducted under Good Laboratory Practices according to provisions in 40 CFR part 792. The solubilities were determined for PV29 after being ground into a fine powder and mixed in water or octanol for 24, 48, or 72 hours at room temperature. To determine the concentration of PV29 dissolved in water or octanol, samples were passed through filters to remove any suspended PV29 particles. The concentration of PV29 dissolved in water or octanol was below the analytical quantitation limit of 0.003 mg/L in every sample tested. These studies confirm that PV29 is an insoluble particulate substance, and there is no expectation that PV29 will be taken up by fat solubility. The octanol-air partitioning coefficient (Koa) describes the distribution of a substance between octanol and air. The results of the octanol solubility experiment, where PV29 was not detected in any sample above the analytical quantitation limit of 0.003 mg/L, demonstrates that PV29 does not dissolve in octanol. Therefore, there is no expectation that PV29 will be taken up by terrestrial organisms through fat solubility.
Concerns about environmental persistence and fate evaluation and lack of data		
SACC, 13, 55	SACC COMMENT: Projection of environmental fate based on one-at-a-time examination of physical properties is unscientific. PUBLIC COMMENTS: EPA downplays the level of environmental persistence for PV29.	EPA issued a Section 4 Test Order to require the manufacturer of PV29, as well as an imported to generate and submit additional testing to measure the solubility of PV29 in water and octanol (more information can be found in the Test Order docket (EPA-HQ-OPPT-2020-0070-0008). The results of this testing are incorporated into the final risk evaluation. This testing was conducted with a modified protocol that accommodates the particular physical-chemical

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	The Belgian Competent Authority issued a document that elaborates on why PV29 should be considered a potential PBT, observing that "[i]n view of the structure of the substances, it is reasonable to expect that the persistent and the very persistent criterion are met for these substances and QSAR estimations support this concern." The Document adds that, for bioaccumulation potential, "the log Kow and log Koa-values are important metrics" and indicate a "high potential for bioaccumulation in air breathers" and that "the substance may accumulate in terrestrial organisms and in mammals." The Document underscores that significant additional testing is needed to better define PV29's P and B properties, in marked contrast to the draft PV29 evaluation, which presumes that PV29 is not a PBT based on the data available.	characteristics of PV29 and was determined to be high quality after review with the data quality evaluation criteria for physical chemical property studies (Nicolaou, 2020). The results of the data quality evaluation of the physical chemical property studies can be found in the supplemental file, "*Systematic Review Supplemental File: Data Quality Evaluation of Physical-Chemical Property Studies* (U.S. EPA, 2020c)." EPA also identified articles on similar organic pigments and used the research results as references to support EPA's fate assessment on PV29. EPA agrees with the assessment that PV29 is a persistent substance. The Belgian assessment relied on experimental results for K_{ow} and K_{oa} which EPA determined to be unacceptable. EPA issued a test order and Sun Chemical Corporation conducted solubility testing showing that PV29 does not dissolve in octanol or water. Therefore, PV29 is considered not bioaccumulative for purposes of TSCA risk evaluation.

Exposure and Releases

Charge Question 4.a: Please comment on the characterization of occupational exposures (inhalation and dermal) for the manufacturing workers. Is the panel aware of other additional relevant information, including PV29 specific data, that could be considered?

Charge Question 4.b: Please comment on the environmental release characterization for the manufacturing and use as a site limited intermediate. Is the panel aware of other relevant additional information, if any, that could be considered?

Charge Question 4.c: Please comment on the exposure and release characterization for the downstream processors and users. Is the panel aware of other PV29 specific data and/or information that could be considered?

Charge Question 4.d: Please comment on the screening level approach used in the context of the conclusions associated with potentially exposed susceptible subpopulations (*e.g.*, to children, workers, or pregnant women). Please comment on other additional information or analyses that could be conducted, if any, in light of the screening level approach used in this case?

Charge Question 4.e: Please comment on the conclusion regarding the need for aggregate exposure.

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Supportive of EPA's occupational exposure assessment		
17, 45	The PV29 estimation of occupational exposure is evidence of the utility of EPA's risk assessment approach in appropriate cases. The current regulatory standards applicable to inert nuisance dusts such as PV29, as well as the limited U.S. production and use of the material, adequately restrict reasonably foreseeable worker exposures.	EPA acknowledges these comments.
Incorporate uncertainty analysis and screening-level fugacity modeling in life cycle safety assessment		
SACC	<u>SACC CCOMMENTS:</u> Incorporate uncertainty analysis into the life cycle safety assessment (LCSA) risk evaluations and, at a minimum, present screening-level calculations when dismissing exposure pathways.	EPA included occupational exposure estimates for inhalation of PV29 for processing and downstream users in the final risk evaluation. According to the developers of the fugacity model, for substances like PV29 with no solubility in octanol or air, this

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	For non-ionizable organics, EPA should adopt a screening level fugacity modeling approach as a default under LCSA.	model may not be useful (Mackay et al., 1996). This is because particulate substances like PV29 do not dissolve in water, air, or octanol like molecular chemicals. Instead, particulate substances will adsorb to solid surfaces and undergo particle transport rather than partition between air, water, and organic (Mackay et al., 1996). To model particulate substances, EPA would need to determine the rates of attachment and detachment of PV29 particles to environmental surfaces. EPA, under TSCA, has not conducted such a modeling effort to date.
EPA did not consider full range of uses and exposure pathways		
12, 13, 17, 18	PUBLIC COMMENTS: EPA failed to identify or evaluate PV29's full range of uses by ignoring many uses identified in the 2012 TSCA Work Plan and uses that other reliable sources consider "intended" and "reasonably foreseen." EPA has dismissed a wide range of uses for PV29 and erroneously suggests that its risk characterization should be limited to "actual use" of PV29. However, TSCA requires EPA to evaluate a chemical's risk under its conditions of use and reasonably foreseen conditions of use. Any circumstances that have been known to have occurred in the past are reasonably foreseen conditions of use and EPA must consider them in the risk evaluation. The risk characterization did not account for the full range of occupational uses and exposures. Workers are potentially exposed by multiple routes including dermal absorption, inhalation, and possibly oral ingestion. EPA must revise its evaluation to reflect all occupational uses and exposures, use its authority to collect data, and reissue for public comment.	TSCA Section 3(4) grants EPA the authority to determine what constitutes a condition of use for a particular chemical substance. In the case of PV29, there were a group of "other uses" that were identified early in the process with poor quality references. Subsequent to the publication of the scope document, no further information was found or received by EPA that substantiated any of the uses with limited and poor-quality references that had been characterized as "other uses." As a result, these uses were determined to not be intended, known, or reasonably foreseen and are not conditions of use. EPA does not believe that it is appropriate to categorically consider all activities that occurred in the past but are not currently occurring to constitute reasonably foreseen conditions of use. As explained in the *Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act* rule preamble, 82 FR 33726, 33730-1 (July 20, 2017), "[i]t is reasonable to foresee a condition of use, for example, where facts suggest the activity is not only possible but, over time under proper conditions, probable." EPA's risk evaluation includes all known, intended, and reasonably foreseen conditions of use. During EPA's initial PV29 use investigation, a search was conducted to create the

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	EPA lacks sufficient information to evaluate potential uses of PV29, including the likely duration, intensity, frequency, and number of exposures under all conditions of use. The omission of even a single condition of use is fatal to EPA's risk evaluation. EPA has not fully evaluated conditions of use for consumers. EPA has ignored reasonably foreseeable uses and uses with evidence that the use is occurring or has recently occurred, particularly with PV29 as an intermediate. EPA did not consider all relevant exposures under the conditions of use (*e.g.*, as an intermediate, import), as required under TSCA. Moreover, EPA's arguments for excluding certain conditions of use cannot simply be extended to exclude consideration of exposures and hazards. EPA refused to analyze certain exposure pathways in depth. EPA should not dismiss exposure pathways on a cursory basis and must consider those exposures when evaluating the combined exposures, not make unjustified exclusions and cursory analyses. When EPA declines to analyze an exposure pathway further, EPA must have a sound, rational basis for the assessment of that exposure and consider how it may combine with other exposure sources.	use document (EPA-HQ-OPPT-2016-0725-0004). This use document was not limited to only TSCA uses or information of a particular level of quality. Subsequent to the publication of the scope document, no further information was found or received by EPA that substantiated any of the uses with limited and poor-quality references that had been characterized as "other uses." As a result, these uses were determined to not be intended, known, or reasonably foreseen conditions of use. This list included the following: Applications in odor agents, cleaning/washing agents, surface treatment, absorbents and adsorbents, laboratory chemicals, light-harvesting materials, transistors, molecular switches, solar cells, optoelectronic devices, paper, architectural uses, polyester fibers, adhesion, motors, generators, vehicle components, sporting goods, appliances, agricultural equipment and oil and gas pipelines (EPA-HQ-OPPT-2016-0725-0004). EPA considered all potential routes of exposure. Based on the physical chemical properties of PV29 and available data about the potential hazards and exposures of PV29, EPA determined that inhalation exposure from manufacturing and processing is the primary route of concern, so this route of exposure was assessed quantitatively. EPA included a quantitative assessment of risks to workers as a result of inhalation exposures in the final risk evaluation. EPA determined that oral exposure was not a relevant route of exposure, as eating, drinking and smoking are prohibited in the PV29 production facility, with the low hazard reported in all oral toxicity studies and the low potential for absorption meant that no risk concerns were identified from oral exposure for all conditions of use. All occupational uses and exposures have been included and

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		evaluated (Refer to Section 2.3.1). Uncertainties were identified regarding reasonably available information characterizing PV29's occupational worker inhalation exposure. These uncertainties resulted in EPA requiring testing of PV29 to develop new information to decrease uncertainty in the final risk evaluation of PV29 under TSCA section 6(b). Test data has been reviewed for data quality according to the relevant data quality evaluation metrics and incorporated into the final risk evaluation. EPA believes it now has sufficient information to assess risk – EPA has used reasonably available information and used TSCA Section 4 Test Order authority where there were uncertainties. Refer to section 2.3.1 in the risk evaluation for the occupational exposures for the conditions of use. EPA has not excluded any condition of use for this evaluation. Each condition of use is intended, known, or reasonably foreseen. The only identified consumer condition of use of PV29 was use in artistic paints and watercolors (Section 2.2.3). Exposures from this condition of use are expected to be low based on physical chemical properties and/or well below those exposures likely to occur compared to occupational users. There were no uses determined to be reasonably foreseeable. As described in a preceding response, there were a group of "other uses" that were identified early in the process with poor quality references. Subsequent to the publication of the scope document, no further information was found or received by EPA that substantiated any of the uses with limited and poor-quality references that had been characterized as "other uses." As a result, these uses were determined to not be intended, known, or reasonably foreseen

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		and are not conditions of use. PV29 as an intermediate is included as a condition of use. Once PV29 is used as an intermediate, it is no longer present; therefore, end products formed following reactions using PV29 as an intermediate are not conditions of use of PV29 and thus are not evaluated. General population and consumer exposures were evaluated to the degree possible given the reasonably available data and expected routes of exposure. In this risk evaluation, EPA determined that aggregating exposure pathways would be inappropriate because the only route of concern is chronic inhalation to PV29, and the lungs are the site of the adverse effects. Chronic exposure to PV29is expected to increase lung burden, overwhelm the lung clearance mechanisms over time, and ultimately result in adverse effects. Exposure via dermal and oral routes is expected to be low due to workplace practices, including use of PPE such as gloves; and any absorption from dermal or oral exposure is expected to be negligible based on the insolubility of PV29. Therefore, these exposure pathways are not expected to influence the toxicity in the respiratory tract". EPA determined that sentinel exposure via inhalation was the most appropriate approach for risk characterization.
EPA failed to consider workers experiencing multiple routes of exposure		
8, 12, 13	EPA failed to account for multiple routes of occupational exposure, such as cleaning paint booths and other locations. EPA's "screening-level analysis of sentinel exposure (dermal and inhalation) to workers" is inadequate because it fails to mention the potential that a worker might be exposure by both inhalation and dermal routes.	TSCA section 6(b)(4)(F)(ii) directs EPA to "describe whether aggregate or sentinel exposures to a chemical substance under the conditions of use were considered, and the basis for that consideration" in risk evaluations. In this risk evaluation, EPA determined that aggregating exposure pathways would be inappropriate because the only route of concern is chronic inhalation to C.I. Pigment Violet 29, and the lungs are the site of the adverse effects. Exposure via dermal and oral routes is expected to be low due to workplace practices, including use

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	EPA repeatedly understates the risks to exposed workers when calculating dermal and inhalation exposures by ignoring the fact that many workers will face both; EPA does not evaluate whether PV29 is safe for workers who both touch and inhale it. EPA's series of rationales for dismissing the significance of worker exposures are weak and based on little actual data or analysis. EPA was unclear in its assumptions regarding dermal exposure levels	of PPE such as gloves; and any absorption from dermal or oral exposure is expected to be negligible based on the insolubility of C.I. Pigment Violet 29. Therefore, these exposure pathways are not expected to influence the toxicity in the respiratory tract. EPA determined that sentinel exposure via inhalation was the most appropriate approach for risk characterization. EPA has updated its assumptions regarding dermal exposure in the final risk evaluation. Dermal exposures are not quantitatively evaluated as it is an insoluble particle that is not expected to be absorbed across the skin.
Deficiencies in exposure data and analysis		
8, 13, 16, 18, 75	<u>PUBLIC COMMENTS:</u> EPA lacks critical exposure information for PV29 and took no steps to require the submission or development of any more exposure data. As a result, the evaluation has major exposure data deficiencies. EPA lacks substantial evidence on occupational exposures from the inhalation and dermal routes. EPA did not comply with TSCA because it did not consider the likely duration, intensity, frequency, or number of exposures for PV29. EPA should require the following data: Use data – Range of concentrations in industrial, commercial, and consumer products – Measured levels of residual PV29 left in products made using PV29 as an intermediate, where PV29 is a reactant or where PV29 is added to adjust the color of other pigments	TSCA requires EPA to use reasonably available information and best available science in its risk evaluation. Utilizing the systematic review process, EPA used reasonably available data and best available science in a weight of scientific evidence analysis. EPA identified uncertainties regarding reasonably available information characterizing the solubility and occupational inhalation exposure (including duration, intensity, frequency, or number of exposures for PV29) for PV29. These uncertainties resulted in EPA requiring testing of PV29 to develop new information, in order for EPA to increase certainty in the final risk evaluation of PV29 under TSCA section 6(b). Test data has been received, reviewed for data quality according to the relevant data quality evaluation metrics and incorporated into the final risk evaluation. For all data elements, except when it relates to solubility or inhalation exposure and toxicity, EPA determined that it has sufficient reasonably available information. With the generation and submission of the additional testing under TSCA section 4, EPA now has enough reasonably available information for most data elements relevant to PV29. Where assumptions were used in the final risk evaluation as a result

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	– Empirical data on frequency of product use for industrial, commercial, and consumer products – Empirical data on duration of product use for industrial, commercial, and consumer products Fate data – Measured data on absorption by inhalation, dermal, and oral routes, for PV29: – as produced in solid (powder) form – as produced in solution form – in each type of formulation in which it is present – Measured water solubility in a reliable study that accurately accounts for pH – Measured bioconcentration factor (BCF) and bioaccumulation factor (BAF) – Appropriate values to assess bioconcentration/bioaccumulation directly from air Environmental release and exposure data – Measured data for air, water, and waste releases from sites of manufacture, processing, and industrial or commercial use; wastewater treatment (both effluent and sludges/biosolids); landfill leachate and effluent and sludges/biosolids from leachate treatment – Measured data for presence/concentration in environmental media and organisms (air, water, sediment; aquatic, sediment-dwelling, and terrestrial organisms) near manufacturing, downstream processing and use, and disposal and land (biosolids) application sites – Occupational exposure data (for all manufacturing and downstream processing and use sites) – Monitoring of air concentrations, for dust, mists,	of deficiencies in the available data, these were explained clearly in the final risk evaluation. Where EPA received additional data from the manufacturing stakeholders of PV29 to reduce uncertainties about the manufacturing practices and environmental releases of PV29, in the form of correspondences with manufacturing stakeholders, this was made publicly available in the docket in the *Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a). This information includes SDSs as well as updates to the Environmental release information (described in Section 2.2) New occupational exposure estimates were added for the manufacturing workers. These estimates were prepared using recent monitoring data and several conservative assumptions. An occupational exposure for the down-stream processors and users were added. These estimates use several conservative assumptions which will cover the reasonable high-end exposure scenarios.

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	aerosols, vapors – Monitoring of dust on surfaces and concentrations in solutions in all settings where skin contact with the surfaces or solutions could potentially occur – Numbers of workers potentially exposed in each activity/setting, at each site – Specific engineering controls, PPE and workplace practices in place at each site/setting, and data on their extent of use and efficacy – SDSs: If EPA plans to rely on SDSs, then EPA needs empirical data on extent of their availability and comprehension to all potentially exposed workers; their completeness, accuracy and currency; extent of compliance with protective measures they specify	
Opposition to EPA's reliance on personal communication from Sun Chemical		
9, 10, 12, 13, 15, 18	PUBLIC COMMENTS: EPA should not have relied on the single personal communication with Sun Chemical Corporation to obtain "air monitoring data" and the "maximum air concentration value." Sun Chemical Corporation is an entity with a strong interest in having EPA find its chemical safe. By relying on this personal communication with the potentially regulated manufacturer, EPA failed to include the full range of job tasks, chronic health/exposure studies, and representative monitoring data necessary to evaluate occupational exposure. While EPA uses this value, the Agency knows nothing about the data quality, how the concentration was determined, or what this workplace air value actually	EPA acknowledges the uncertainty related to the use of a point estimate to describe potential workplace exposure to PV29 dust as a result of workplace activities. In response to these uncertainties as well as public and SACC comments, EPA issued a TSCA Section 4(a)(2) Test Order for PV29 on February 28, 2020. This Test Order required the generation and submission of a workplace breathing zone air monitoring study of respirable particles not otherwise regulated, conducted according to the NIOSH 0600 guideline available at: https://www.cdc.gov/NIOSH/DOCS/2003-154/pdfs/0600.pdf. This study takes into account a range of job tasks as reported by the Sun Chemical Corporation (sole U.S. manufacturing facility) and representative monitoring of PV29 dust in the breathing zone. This study has been evaluated for data quality and the results are incorporated into the final risk evaluation. More information about the Section 4 Test Order for PV29 can be found in the docket (EPA-HQ-OPPT-2020-0070-0008). As a result, the point estimate value

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	represents. This personal communication does not constitute the "best available science." OSHA refuses to rely on undocumented exposure measurements offered by industry without study details and requires employers to preserve exposure records; EPA should have requested these monitoring data and protocols from employers (*i.e.*, Sun Chemical Corporation) in order to evaluate their data submission. EPA should take steps to allow workers to provide input in a manner that reduces the risks of any potential retaliation from management.	of 0.5 mg/m^3 presented in the draft risk evaluation is no longer used in the risk evaluation. During the data collection phase of the risk evaluation process, EPA welcomed comments and information on occupational exposure. The Agency did not receive any comments to consider.
Concern regarding EPA's approach to evaluate only highest anticipated exposure		
13	PUBLIC COMMENTS: EPA's assertion that it need only account for the highest anticipated exposure ignores the potential that multiple sources of exposure (*e.g.*, at work and at home) may engender a risk greater than the risk from the highest exposure alone. EPA's decision to conduct only a screening-level assessment of certain workers and claim that it can serve as the sole sentinel exposure for all other human exposures is scientifically corrupt and fails to meet TSCA's mandates.	TSCA section 6(b)(4)(F)(ii) directs EPA to "describe whether aggregate or sentinel exposures to a chemical substance under the conditions of use were considered, and the basis for that consideration" in risk evaluations. EPA defines aggregate exposures as the combined exposures to an individual from a single chemical substance across multiple routes (*i.e.*, dermal, inhalation, or oral) and across multiple pathways (*i.e.*, exposure from different sources). 40 CFR 702.33. EPA defines sentinel exposures as the exposure from a single chemical substance that represents the plausible upper bound of exposure relative to all other exposures within a broad category of similar or related exposures. 40 CFR 702.33. EPA considered the reasonably available information and used the best available science to determine whether to consider aggregate or sentinel exposures for PV29. EPA has determined that using the high-end exposure for inhalation risks separately from other pathways as the basis for the unreasonable risk determination is a best available science approach.

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		EPA determined that aggregating exposure pathways would be inappropriate because the only route of concern is chronic inhalation to PV29, and the lungs are the site of the adverse effects. Chronic exposure to C.I. Pigment Violet 29 is expected to increase lung burden which may result in kinetic lung overload, a pharmacokinetic phenomenon, which is not due to the overt toxicity of the chemical, but rather the possibility that C.I. Pigment Violet 29 dust overwhelms the lung clearance mechanisms over time and ultimately result in adverse effects.. Exposure via dermal and oral routes is expected to be low due to workplace practices, including use of PPE such as gloves; and any absorption from dermal or oral exposure is expected to be negligible based on the insolubility of PV29. Therefore, these exposure pathways are not expected to influence the toxicity in the respiratory tract. Therefore, EPA determined that sentinel exposure via inhalation was the most appropriate approach for risk characterization. Available data for PV29 indicate low hazard and low potential for exposures for oral and dermal exposures. As a result, it was determined that a mix of quantitative assessment and qualitative assessment, was the most optimal approach to focus efforts on the exposure pathways that are most likely to result in potential risks.
Supports tiered approach that incorporates PPE in the exposure assessment		
17	PUBLIC COMMENTS: EPA should use a tiered approach to exposure assessment that incorporates PPE. Margin of exposure (MOE) calculations did not account for PPE (which is acceptable in this case), but EPA should use higher tier methods that account for worker protections when necessary.	In the final risk evaluation, EPA calculated risks (MOEs) without PPE and with PPE.
Opposes assumption of PPE use in the exposure assessment		

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
11, 12, 13, 15, 16, 18, 44, 77, 82	PUBLIC COMMENTS: EPA should not use the baseline assumption that PPE is used, and used correctly, when assessing occupational exposure. EPA makes incorrect assumptions regarding absence of data, extrapolation of data to alternate exposure routes, exposure characteristics, use of PPE, adherence/enforcement to workplace policies (*i.e.*, no-eating-or-smoking policy), model inputs, and similarities between PV29 and other chemicals. There appear to be no empirical data to document the extent of use or effectiveness of any of industrial hygiene controls, such as PPE or SDS adherence. EPA should use its authority to require data in order to have empirical data on actual use of PPE. No information is provided on the type of PPE used and whether it is sufficiently protective to reduce oral exposure. Given that EPA has not identified the workplaces where PV29 is used, it has no basis for assuming the use or effectiveness of unspecified PPE. EPA has an obligation to evaluate exposures and risks for the subset of people for whom engineering controls are not in place or do not reach 100% efficiency.	Through correspondences with Sun Chemical, and by consulting the SDSs available for PV29, EPA has gathered information about the types of PPE utilized throughout the manufacturing process for PV29. This information is being made publicly available in the *Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a). Statements on SDS and use of PPE by the downstream processors and users were updated to indicate the uncertainties. For the purpose of the final risk evaluation, EPA makes assumptions about potential PPE use based on reasonably available information and expert judgment. EPA considers each condition of use and constructs exposure scenarios with and without engineering controls and /or PPE that may be applicable to particular worker tasks on a case-specific basis for a given chemical. Again, while EPA has evaluated worker risk with and without PPE, as a matter of policy, EPA does not believe it should assume that workers are unprotected by PPE where such PPE might be necessary to meet federal regulations, unless it has evidence that workers are unprotected. For the purposes of determining whether or not a condition of use presents unreasonable risks, EPA incorporates assumptions regarding PPE use based on information and judgement underlying the exposure scenarios. These assumptions are described in the unreasonable risk determination for each condition of use, in Section 5. Additionally, in consideration of the uncertainties and variabilities in PPE usage, including the duration of PPE usage, EPA uses the high-end exposure value when making its unreasonable risk determination in order to address those uncertainties. EPA has also outlined its PPE assumptions in

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
		Section 5 and EPA's assumptions are described in the unreasonable risk determination for each condition of use. In the case of PV29, risks were not identified for oral exposure because of low exposure and low hazard for oral exposure. Therefore, use of workplace practices prohibiting eating, drinking and smoking in manufacturing and processing facilities is important but not an ultimate determining factor in whether risks are expected for oral exposure.
EPA should not rely on the presence of and compliance with safety data sheets (SDS)		
11, 12, 13, 15, 18	PUBLIC COMMENTS: It is unacceptable for EPA to rely on the presence of accurate, well-understood SDSs and that workers and employers will comply with SDSs as a means to minimize occupational exposure. EPA provides no evidence to support this assumption that workers will read and understand SDS; in fact, there is extensive evidence it is incorrect in many instances. SDSs should not be a substitute for a workplace control plan to eliminate and mitigate PV29 occupational exposure. EPA assumes without evidence that engineering controls and PPE described in unpublished industry SDSs are universally used in all workplaces. Manufacturer admonitions on SDSs are not enforceable and cannot support a determination that PV29 presents no unreasonable risk. Workers and small employers often have a great deal of trouble understanding SDSs. Employers often ignore not	Statements on PPE use by the downstream processors and users were updated to include a discussion of the uncertainties. As stated above, for the purpose of final risk evaluation, EPA makes assumptions about potential PPE use based on reasonably available information and expert judgment. EPA considers each condition of use and constructs exposure scenarios with and without engineering controls and /or PPE that may be applicable to particular worker tasks on a case-specific basis for a given chemical. Again, while EPA has evaluated worker risk with and without PPE, as a matter of policy, EPA does not believe it should assume that workers are unprotected by PPE where such PPE might be necessary to meet federal regulations, unless it has evidence that workers are unprotected. For the purposes of determining whether or not a condition of use presents unreasonable risks, EPA incorporates assumptions regarding PPE use based on information and judgement underlying the exposure scenarios. These assumptions are described in the unreasonable risk determination for each condition of use, in Section 5. Additionally, in consideration of the uncertainties and variabilities in PPE usage, including the duration of PPE usage, EPA uses the high-end exposure value when making

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	only SDS recommendations, but basic, common-sense safety rules. SDSs often contain inaccuracies and are incomplete, as concluded by a review study of 24 SDSs. EPA appears to be operating under a significant misunderstanding of OSHA's Hazard Communication Standard (HCS); a recommendation on a safety data sheet by itself would not trigger the need to implement new controls.	its unreasonable risk determination in order to address those uncertainties. The OSHA regulations at 29 CFR 1910.132 require employers to assess a workplace to determine if hazards are present or likely to be present which necessitate the use of personal protective equipment (PPE). If the employer determines hazards are present or likely to be present, the employer must select the types of PPE that will protect against the identified hazards, require employees to use that PPE, communicate the selection decisions to each affected employee, and select PPE that properly fits each affected employee.
EPA should prioritize engineering controls over PPE or warning labels to reduce exposure		
11, 12, 13, 15, 18	PUBLIC COMMENTS: Under OSHA Hierarchy of Controls, PPE is the least effective form of protection; EPA should use this hierarchy and prioritize measures to reduce occupational exposure, not rely on PPE or warning labels to reduce exposure. There is widespread support, including in court, for the hierarchy of control. The most effective way to control dust in the workplace is through engineering controls, rather than PPE; reliance on PPE rather than engineering controls is unacceptable.	As indicated above, for the purpose of this final risk evaluation, EPA makes assumptions about potential PPE use based on reasonably available information and expert judgment. EPA considers each condition of use and constructs exposure scenarios with and without engineering controls and /or PPE that may be applicable to particular worker tasks on a case-specific basis for a given chemical.
Concerns about lack of release data		
13	PUBLIC COMMENTS: EPA has no actual data on the levels of PV29 released to or present in workplaces, products, or environmental media and has not used its authorities to require these data.	EPA requested additional info detailing possible releases of PV29 to the environment. That information is communicated in Section 3.2 and the *Supplemental File: Information Received from Manufacturing Stakeholders* with resultant releases to surface water being <1lb/day (U.S. EPA, 2020a).

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		Other PV29 that may be captured in wastewater sludge is disposed of via permitted landfills. EPA issued a TSCA Section 4 Test Order to measure PV29 respirable dust in the breathing zone of workers in the Sun Chemical Corporation workplace.
Support for EPA's engagement with industry to obtain data		
19	PUBLIC COMMENTS: EPA did the right thing by engaging with industry and seeking actual data to answer its questions, *i.e.*, for working with Sun Chemical to understand the manufacturing conditions and potential for worker exposures and environmental releases.	EPA acknowledges the comment.
Concerns about occupational inhalation exposure assessment assumptions and parameters		
13, 78	PUBLIC COMMENTS: EPA calculated a potential dose rate based on a NIOSH inhalation exposure rate that is over 40 years old, which is inadequate, or EPA should provide empirical evidence supporting its use. EPA assumes without explanation or justification that workers could inhale PV29 only in dust form. CPMA submitted a comment noting use of PV29 in downstream applications involving high heat (could generate vapors) or spraying (could generate mists or aerosols), yet EPA fails to mention or analyze the potential for inhalation of forms other than powder or dust. EPA should clarify the procedure through which PV29's particle size distribution was calculated, and, if bulk material was tested, redo its analysis to reflect the size distribution for the airborne particles to which workers are exposed.	EPA has updated the final risk evaluation to incorporate actual monitoring information collected from the sole US manufacturer of PV29, Sun Chemical Corporation. Through communications with Sun Chemical, EPA obtained monitoring data information used to assess if measures of total dust in the worker breathing zone was below the associated regulatory limit. This information along with all information used in the assessment that was provided by the US manufacturing stakeholders for PV29 can be found in the *Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a). The NIOSH inhalation exposure rate is not used in the final risk evaluation. Downstream workers may be exposed to PV29 in mist (paint and ink). In the final risk evaluation, EPA estimated exposures based on dust measurements in the original Sun Chemical Workplace to estimate exposures for downstream workers.

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		Available Particle size distribution data for PV29 is described in the final risk evaluation based on information in the *Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a).
Concerns about occupational dermal exposure analysis and clarity		
13	PUBLIC COMMENTS: To assess dermal occupational exposure, EPA relied on modeling, even though EPA itself acknowledges that measured workplace exposure data is preferable to modeling. Some aspects of the modeling are conservative (*e.g.*, a "high" default for the amount of solid material contacting skin, assumed no use of gloves) and others are not (*e.g.*, assumed single exposure event per worker per day, assumed a single worker is exposed per day) even though the range of activities to which the model applies would clearly have the potential to involve multiple exposures per day or exposure of multiple workers. EPA presented only a single dermal exposure scenario that it claims represents the "theoretical maximum exposure" with no basis for this characterization. EPA's dermal exposure analysis assumed only PV29 in solid form, yet PV29 is also produced in the form of a high-concentration solution. EPA hand-waves away dermal exposure in part by assuming that PPE is always used and used effectively.	EPA has updated its approach in the final risk evaluation. No quantitative dermal modeling was carried out in the final risk evaluation because of the low potential for exposure due to low solubility of the chemical. As a result, the discussion of exposure scenarios has been updated in the final risk evaluation in Section 2.3.1.3.
EPA should revisit its decision not to assess occupational oral exposure		
12, 13, 15	PUBLIC COMMENTS: EPA's argument assumes that oral exposure only occurs if workers eat contaminated food or smoke is incorrect.	EPA agrees that oral exposures are possible other than from contaminated food or smoking. EPA's inhalation exposure estimate included oral exposure via incidental ingestion of

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	This argument assumes without any documentation that there is 100% compliance with the no-eating-or-smoking policy. Research has revealed that incidental ingestion from hand-to-mouth contact occurs in the workplace. EPA should more closely assess the potential for oral exposure via pathways beyond ingestion of contaminated food. Dermal and inhalation exposures make oral ingestion likely in a workplace. EPA hand-waves away oral exposure in part by assuming that PPE is always used and used effectively. EPA's blanket rejection of the oral route of exposure is not supported by science; it has been estimated that approximately one in six workers may be involved in tasks in which inadvertent ingestion exposure could contribute to their total body burden.	inhaled mist/dust. However, EPA currently does not have data or methods to fractionate the total PV29 inhaled into the amount of PV29 that deposits in the upper respiratory system and the amount of PV29 that goes into the lung. EPA generally does not separately evaluate occupational exposures through the oral route. Workers may inadvertently transfer chemicals from their hands to their mouths or ingest inhaled particles that deposit in the upper respiratory tract. The frequency and significance of this exposure route are dependent on several factors including the physical-chemical properties of the substance during worker activities, the visibility of the chemicals on the hands while working, workplace training and practices, and personal hygiene that is difficult to predict (Cherrie et al., 2006). EPA may consider the relevance of oral exposure route on a case-by-case basis, taking into consideration the aforementioned factors and any reasonably available information, and may assess oral exposure for workers for certain COUs and worker activities where warranted. For PV29, EPA did not find any information indicating significant oral exposure during the systematic review of the materials found.
EPA did not properly assess exposure of downstream processors and users		
11, 12 13, 15, 16, 44, 55	PUBLIC COMMENTS: EPA assumes that downstream processors and users are at low risk of exposures because they wear PPE, which is an incorrect way to assess health risk. EPA restricts its occupational exposure analysis to the site of manufacture, failing to account for worker exposures at downstream processing and use sites.	The final risk evaluation includes evaluation of risks associated with inhalation of PV29 dust for downstream occupational processors and users. These estimates use several conservative assumptions based on exposures in the original Sun Chemical Corporation workplace. Statements on SDS and PPE use by the downstream processors and users were updated to indicate the

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	EPA does not appear to have received or obtained significant information from the processors of PV29, only the sole manufacturer. EPA's analysis is based on the unsupported assertion that downstream worker exposure and industrial uses will be less than manufacturing exposure because volume handled is less and the manufacturing exposure represents a "worst case"; there is no basis for this. It is inappropriate for EPA to discount exposure at processing and use sites since EPA has no data on the of use or efficacy of engineering controls, SDS, and PPE downstream. EPA inappropriately used the approximate maximum workplace air concentration reported in a personal communication from Sun Chemical to estimate downstream worker exposure. Downstream occupational exposure may significantly exceed manufacturing site exposure given the potentially different activities and controls that might be in place. EPA has failed to use the best available science for downstream exposure. EPA lacks data on potential exposure of downstream workers at processing and use sites, number of sites involved, and number of potentially exposed workers.	uncertainties.

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	Without evaluating downstream exposures, EPA has no basis for comparing risks faced by manufacturing workers to those who work with or use downstream products. EPA has failed to use its authority to collect data on downstream exposure.	
Concerns about the environmental release characterization		
13, 16	PUBLIC COMMENTS: EPA fails to include basic information about environmental release critical for a meaningful assessment of PV29's risks to the environment, as required by TSCA. No calculation or data are presented to support the conclusion that approximately 1-2% of the production volume is released into the environment. EPA relies on industry determination that use is restricted to a single site; as a result, sources of exposure are overlooked. The only remotely "quantitative" element regarding exposures is the manufacturer's asserted estimate for water discharges from its facility, but this value is unreliable and insufficient. EPA does not properly analyze distribution and gives no attention to potential releases and exposures resulting from accidental releases. EPA's analysis of biosolids is particularly lacking; a thorough analysis of biosolids would be appropriate given that PV29 is poorly biodegradable.	EPA requested additional info detailing possible releases of PV29 to the environment and based its environmental risk characterization on the best reasonably available information. The information received from communications with Sun Chemical is included in the *Supplemental File: Information Received from Manufacturing Stakeholders* with resultant releases to surface water being <1lb/day (U.S. EPA, 2020a). Other PV29 that may be captured in wastewater sludge is disposed of via permitted landfills. EPA concedes the uncertainty associated with this information and has added language discussing this uncertainty. Nevertheless, it was the best reasonably available information concerning possible releases of PV29 to the environment. Accidental releases, spills and leaks generally are not included within the scope of a TSCA risk evaluation. EPA is exercising its authority under TSCA to tailor the scope of the risk evaluation for PV29, rather than evaluating activities which are determined not to be circumstances under which PV29 is intended, known or reasonably foreseen to be manufactured, processed, distributed, used, or disposed of, or environmental exposure pathways addressed by another EPA-administered statute and associated regulatory program. First, EPA does not identify PV29 spills or leaks as "conditions of use." EPA does not consider PV29 spills or leaks to constitute circumstances under which PV29 is manufactured, processed, distributed, used, or disposed of, within TSCA's definition of

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		"conditions of use." Congress specifically listed discrete, routine chemical lifecycle stages within the statutory definition of "conditions of use" and EPA does not believe it is reasonable to interpret "circumstances" under which PV29 is manufactured, processed, distributed, used, or disposed of to include uncommon and unconfined spills or leaks for purposes of the statutory definition. Further, EPA does not generally consider spills and leaks to constitute "disposal" of a chemical for purposes of identifying a COU in the conduct of a risk evaluation. In addition, even if spills or leaks of PV29 could be considered part of the listed lifecycle stages of PV29, EPA has "determined" that spills and leaks are not circumstances under which PV29 is intended, known or reasonably foreseen to be manufactured, processed, distributed, used, or disposed of, as provided by TSCA's definition of "conditions of use," and EPA is exercising its discretionary authority to exclude PV29 spills and leaks from the scope of the PV29 risk evaluation. The exercise of that authority is informed by EPA's expertise in developing scoping documents and risk evaluations, and on various TSCA provisions indicating the intent for EPA to have some discretion on how best to address the demands associated with implementation of the full TSCA risk evaluation process. Specifically, since the publication of the Risk Evaluation Rule, EPA has gained expertise by conducting ten risk evaluations and designating forty chemical substances as low- and high-priority substances. These processes have required EPA to determine whether the case-specific facts and the reasonably available information justify identifying a particular activity as a "condition of use." With the experience EPA has gained, it is better situated to discern circumstances that are appropriately considered to be outside the bounds of "circumstances… under which a

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
		chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of" and to thereby meaningfully limit circumstances subject to evaluation. Inclusion of spills and leaks as part of the risk evaluation, could result in potentially expansive and potentially boundless impacts making the conduct of the risk evaluation untenable within applicable deadlines. Spills and leaks are determined not to be circumstances under which PV29 is intended, known or reasonably foreseen to be manufactured, processed, distributed, used, or disposed of, as provided by TSCA's definition of "conditions of use." Exercising the discretion to not identify spills and leaks of PV29 as a COU is consistent with the discretion Congress provided in a variety of provisions to manage the challenges presented in implementing TSCA risk evaluation. See *e.g.*, TSCA sections 3(4), 3(12), 6(b)(4)(D), 6(b)(4)(F). In particular, TSCA section 6(b)(4)(F)(iv) instructs EPA to factor into TSCA risk evaluations "the likely duration, intensity, frequency, and number of exposures under the conditions of use…," suggesting that activities for which duration, intensity, frequency, and number of exposures cannot be accurately predicted or calculated based on reasonably available information, including spills and leaks, were not intended to be the focus of TSCA risk evaluations. And, as noted in the preamble to the Risk Evaluation Rule, EPA believes that Congress intended there to be some reasonable limitation on TSCA risk evaluations, expressly indicated by the direction in TSCA section 2(c) to "carry out [TSCA] in a reasonable and prudent manner." EPA qualitatively assessed discharges of PV29 in biosolids based on its physical chemical and fate properties. Based on its low solubility (<0.003 mg/L), PV29 in land-applied biosolids is not expected to leach to soil or groundwater.

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		PV29 is not expected to bioconcentrate in aquatic organism tissues, and concentrations will not increase from prey to predator in either aquatic or terrestrial food webs.
EPA did not consider environmental release of PV29 when used as an intermediate		
13	PUBLIC COMMENTS: EPA asserts without evidence that use of PV29 as an intermediate does not result in environmental releases and exposures and does not mention the potential for PV29 to remain in products generated from its use as an intermediate. EPA leaves open the question of whether intermediate use of PV29 is restricted to a single site or may involve more than one site, which would involve storage, transport, and transfer and thus greater risk of release and exposure.	Release and exposure to any incidental residual PV29 present in products where it is used as an intermediate is expected to be lower than the exposure and releases from the production and handling of pure PV29. The vast majority of the total manufactured volume of PV29 is consumed at the manufacturing facility as an intermediate for the production of other pigments. The residual PV29 in these finished pigments is low due to the reaction efficiency, and any exposure to residual amounts of residual PV29 that will result from the handling of these other pigments is expected to be negligible. As a result, the final concentration of PV29 as a residual, in coatings and plastics will be negligible in comparison to the exposure expected to result from the handling of PV29.
Concern about assumption that PV29 remains "bound" in downstream use		
13, 16(S)	PUBLIC COMMENTS: There are reasons to question the notion that PV29 is "bound in a matrix" once in consumer products, including at end-of-life. EPA failed to consider the disposition of PV29 when products, including plastics, enter the waste and recycling streams, where any "encapsulated" compound may be released. EPA should not rely on a food additives petition to FDA that is not publicly available to conclude that PV29 will not leach from plastics or paints.	As stated in the risk evaluation, PV29 is not expected to leach out of plastics when it is encapsulated. PV29 demonstrates negligible solubility in both octanol and water, and no toxicity effects were observed following oral or dermal exposure. Additional data submitted to fulfill the conditions of the Section 4 test order confirm that PV29 exhibits a low solubility in octanol and water (<0.003 mg/L). This reduces the uncertainties concerning possible leaching of PV29 from plastics once it is encapsulated. EPA is not relying on the results of the food additive petition to draw conclusions about the potential for PV29 to leach from plastics. The same data used in the final risk evaluation is also used the food additive petition and as a result, similar

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
		conclusions were drawn in both documents regarding the potential for leaching from plastics.
EPA was right to remove conditions of use it was unable to support		
8, 17, 45	EPA was right to remove "other uses" and "import" as conditions of use due to the inability to support these uses. If there were no data of concern or all uses were already covered and non-standard uses were not anticipated, EPA should make such a statement.	Based on information provided in public comments, EPA has included import as a condition of use in the final risk evaluation.
Evaluation lacks information on conditions of use		
12, 13, 16, 16(S), 82	PUBLIC COMMENTS: The draft risk evaluation lacks crucial information on the conditions of use of PV29. In particular, EPA ignored the presence of PV29 in products made using PV29 as an intermediate even though the evidence in the record establishes that PV29 often remains present in such products. EPA has provided no analysis explaining why "import" and the "other" uses are no longer considered reasonably foreseen, especially given that PV29 has a domestic market and is sold to downstream processors and users, so may be imported in the future. It is reasonably foreseeable that persons might use PV29 in those same circumstances in the United States if persons already use PV29 for those purposes abroad. EPA made no effort to further identify "unknown" uses. By dismissing certain conditions of use based on little evidence, EPA violates its duty under the statutory language to consider all conditions of use, exposures, and hazards.	The final risk evaluation includes more detailed information on the conditions of use of PV29. The vast majority of the total manufactured volume of PV29 is consumed at the manufacturing facility as an intermediate for the production of other pigments. The residual PV29 in these finished pigments is low due to the reaction efficiency, and any exposure to residual amounts of residual PV29 that will result from the handling of these other pigments is expected to be negligible. As a result, the final concentration of PV29 as a residual, in coatings and plastics will be negligible in comparison to the exposure expected to result from the handling of PV29. Following the publication of the Draft Risk Evaluation, information was received from a group of NGOs indicating that BASF Corporation imports C.I. Pigment Violet 29 in volumes less than 25,000 pounds per year (EPA-HQ-OPPT-2018-0604-0016). Therefore, import of C.I. Pigment Violet 29 is included as a condition of use in the final risk evaluation. A list of "other uses" was compiled during EPA's initial search for PV29 conditions of use. This list of other uses included the following: Applications in odor agents, cleaning/washing agents, surface treatment, absorbents and

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	By excluding downstream conditions of use (*e.g.*, candles, carpet fibers, paint, coatings), EPA failed to evaluate downstream worker and consumer exposure. The risks of these additional activities, in combination with those from the originally intended activities, could well increase to a point where EPA would find that the chemical "presents" or "may present" an unreasonable risk. Hence it is vital that EPA consider both intended and reasonably foreseen conditions of use in its initial review.	adsorbents, laboratory chemicals, light-harvesting materials, transistors, molecular switches, solar cells, optoelectronic devices, paper, architectural uses, polyester fibers, adhesion, motors, generators, vehicle components, sporting goods, appliances, agricultural equipment and oil and gas pipelines (EPA-HQ-OPPT-2016-0725-0004). However, no further evidence was found or submitted during the scope, problem formulation and draft risk evaluation steps to support these "other uses" as intended, known, or reasonably foreseen conditions of use for C.I. Pigment Violet 29. As a result, these uses were determined to not be intended, known, or reasonably foreseen conditions of use. EPA disagrees that it made no effort to further identify unknown uses or dismissed certain conditions of use based on little evidence. EPA conducted extensive research and outreach including review of published literature and online databases including the most recent data available from EPA's Chemical Data Reporting program (CDR) and Safety Data Sheets (SDSs). EPA also conducted online research by reviewing company websites of potential manufacturers, importers, distributors, retailers, or other users of C.I. Pigment Violet 29 and queried government and commercial trade databases. EPA also received comments on the *Scope of the Risk Evaluation for Pigment Violet 29* (U.S. EPA, 2017c) that were used to identify the current conditions of use. EPA also convened meetings with companies, industry groups, chemical users, states, environmental groups, and other stakeholders to aid in identifying conditions of use and verifying conditions of use identified by EPA. Those meetings included a February 14, 2017 public meeting with such entities and a September 15, 2017 meeting with several representatives from trade associations.

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
		EPA disagrees that it has a statutory duty to consider all conditions of use in each risk evaluation. As explained in the final rule for Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act, TSCA section 6(b)(4)(D) requires EPA to identify "the hazards, exposures, conditions of use, and the potentially exposed or susceptible subpopulations the Administrator expects to consider" in a risk evaluation, suggesting that EPA may exclude certain activities that EPA has determined to be conditions of use on a case-by-case basis. (82 FR 33736, 33729; July 20, 2017). For example, EPA may exclude conditions of use that the Agency has sufficient basis to conclude would present only *de minimis* exposures or otherwise insignificant risks (such as use in a closed system that effectively precludes exposure or use as an intermediate) or that have been adequately assessed by another regulatory agency. EPA has included a more detailed discussion of potential risks for downstream conditions of use in the final risk evaluation.
Inadequate characterization of potentially exposed or susceptible sub-populations (PESS)		
11, 13, 14, 16	PUBLIC COMMENTS: EPA dismissed concerns about exposures of vulnerable subpopulations, distorting the law's definition and failing to meet TSCA's requirements. EPA's approach of accounting for the highest anticipated exposure ignores the potential that a lower exposure may result in greater risk to a member of a vulnerable subpopulation. EPA should identify people living near disposal sites, sources of contamination, and other conditions of use as PESS.	PV29 is manufactured (as a solid) in one workplace in the U.S and is either used to produce other pigments in their workplace or sold as a solid to other processors. EPA identified workers and occupational non-users, as well as consumers and bystanders to consumer use, as relevant PESS due to their greater potential exposure and evaluated whether PV29 presents an unreasonable risk to those groups. EPA uses the high-end exposure value when making its unreasonable risk determination in order to address uncertainties around PPE usage as well as to capture the upper end of exposures which would include PESS.

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	EPA should always evaluate exposures scenarios without engineering controls and PPE in order to assess exposures and risks to those subpopulations not subject to such controls. Workers are a relevant PESS, and EPA has not provided adequate evidence that it has made an accurate determination as required by TSCA. EPA assertions that the risk evaluation is protective of workers, consumers and the general population are not supported by data.	EPA is making an unreasonable risk determination in the final risk evaluation based on the high-end exposures for workers and factoring in the uncertainties by retaining the full Uncertainty Factor (UF_H) of 10; thereby considering variability among the human population, including PESS, for risk evaluation.
Support for and request for clarity regarding quantitative screening-level exposure assessment		
8, 17	PUBLIC COMMENTS: Two commenters generally support the quantitative screening level exposure assessment approach used by EPA. EPA should explain why a quantitative screening-level exposure assessment was added, given that it was not anticipated in the problem formulation and scoping phase. EPA should explain how quantitative exposure assessment data were obtained and checked for their reliability and accuracy.	EPA initially used the screening level-approach in the assessment of possible risks for worker exposures to PV29 dust by inhalation. The concern was for workers as a highly exposed population within the sole US manufacturing facility of PV29. In response to comments received from the public as well as the SACC, EPA has worked to obtain additional exposure information for PV29 in order to refine and enhance the analyses of inhalation of exposures for occupational exposures and risks made in the initial screening-level risk calculations.
EPA did not address exposures in pregnant women, children, and other downstream users		
9, 10, 12, 16, 16(S)	PUBLIC COMMENTS: EPA's evaluation of PESS does not cover populations that are known to be more susceptible to chemical hazards, such as pregnant women or children, particularly workers who could be pregnant. EPA fails to consider downstream exposure of users of products such as paints, art supplies, toys, food packaging,	As stated in the risk evaluation, the reasonably available data does not indicate increased susceptibility for any particular group or subpopulation. In addition, based on available data for high end exposure to workers handling PV29 in an occupational setting, EPA is confident that this presents a high-end exposure scenario.

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	plastics, candles, and carpets containing PV29, which particularly significant because PV29-containing products can be used by pregnant women and children who are more susceptible to environmental hazards. EPA cannot assume that pregnant women or children exposed during downstream use have lesser exposures and are adequately protected. Children crawling on carpets containing PV29 can potentially be exposed through dermal contact and ingestion. PV29 can also become dispersed into the indoor environment through routine abrasion and cleaning.	
EPA was correct to focus on sentinel exposure		
17, 19	PUBLIC COMMENTS: EPA was correct to focus on sentinel exposure for PV29, but if the Agency conducts aggregate exposure assessments in the future, it must be clear about how and what it considered and show that it was appropriate to do so. EPA's conservative assumptions with regard to inhalation and dermal exposures are protective and appropriate.	EPA acknowledges these comments and encourages the submitters to consult the final Risk Evaluation for refinements made since the publication of the draft risk evaluation.
Support for aggregate exposure vs. sentinel exposure assessment		
SACC, 10, 13	SACC COMMENTS: Aggregate exposures should be considered including use of PV29 in food packaging. PUBLIC COMMENTS:	The presence of PV29 in food packaging is under the purview of the Food and Drug Administration and no information was identified to understand the production and uses of PV29 as a result of these pathways. TSCA section 6(b)(4)(F)(ii) directs EPA to "describe whether aggregate or sentinel exposures to a chemical substance under the conditions of use were considered, and the basis for that

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	EPA should combine all routes of exposure (including dermal, oral, and inhalation) when making a risk determination. EPA's rationale for adopting a sentinel over aggregate exposure assessment approach is inadequate, distorts the meaning of sentinel exposure assessment, and is not a science-based approach.	consideration" in risk evaluations. EPA defines aggregate exposures as the combined exposures to an individual from a single chemical substance across multiple routes (*i.e.*, dermal, inhalation, or oral) and across multiple pathways (*i.e.*, exposure from different sources). 40 CFR 702.33. EPA defines sentinel exposures as the exposure from a single chemical substance that represents the plausible upper bound of exposure relative to all other exposures within a broad category of similar or related exposures. 40 CFR 702.33. EPA considered the reasonably available information and used the best available science to determine whether to consider aggregate or sentinel exposures for a particular chemical. EPA has determined that using the high-end risk estimate for inhalation and risks from other routes of exposure separately as the basis for the unreasonable risk determination is a best available science approach. In this risk evaluation, EPA determined that aggregating exposure pathways would be inappropriate because the only route of concern is chronic inhalation to C.I. Pigment Violet 29, and the lungs are the site of the adverse effects. Chronic exposure to C.I. Pigment Violet 29 is expected to increase lung burden, overwhelm the lung clearance mechanisms over time, and ultimately result in adverse effects. Exposure via dermal and oral routes is expected to be low due to workplace practices, including use of PPE such as gloves; and any absorption from dermal or oral exposure is expected to be negligible based on the insolubility of C.I. Pigment Violet 29. Therefore, these exposure pathways are not expected to influence the toxicity in the respiratory tract". Therefore, EPA determined that sentinel exposure via inhalation was the most appropriate approach for risk characterization.
EPA should pursue exposure and releases information from a wider range of organizations		
SACC	SACC COMMENTS:	When preparing this Risk Evaluation, EPA obtained and considered reasonably available information, defined in 40

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
	More aggressively pursue information from manufacturer(s) of life cycle sustainability assessment (LCSA) targets, purchasers/users of those chemicals, trade associations, and other federal and state regulatory agencies that may have specialized knowledge.	CFR 702.33 as information that EPA possesses or can reasonably generate, obtain and synthesize for use in risk evaluations, considering the deadlines for completing the evaluation. EPA also communicated with manufacturing stakeholders of C.I. Pigment to better understand the production and uses of PV29.
Other SACC comments related to physical chemical properties		
SACC	SACC COMMENTS: Refrain from making sweeping generalizations especially when based on limited and/or uncertain information regarding physical chemical properties or toxicological testing. Include $J_{max, ss}$ (maximum steady-state dermal flux) estimates in their list of physical chemical properties routinely reported in TSCA risk assessments.	By definition, the maximum steady-state dermal flux is calculated using the dermal permeability coefficient (Kp) and the solubility of a substance both in the same vehicle. Since PV29 is not soluble in any solvents except strong acids, this value cannot be estimated.

Environmental Effects

Charge Question 5.a: Please comment on the evidence used to support the characterization of hazard to ecological receptors from acute and chronic exposure as presented in the document.

Charge Question 5.b: Strong sorption to sediment is indicated as a result of the estimated K_{oc} of 5.0 based on estimations from EPI Suite™. While this indicates that exposures to aquatic organisms in the water column are likely to be low, this also indicates that potential water releases could result in exposure to sediment-dwelling organisms. EPA assumed low hazard to these organisms due to the lack of toxicity observed in the tests conducted with all other aquatic species, particularly *Daphnia magna*. Given the acute hazard profile for this chemical, limited releases, and the physical-chemical characteristics of PV29, please comment on the risk characterization for sediment-dwelling invertebrates.

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
Need for more data to evaluate hazard to aquatic ecological receptors		
13, 16, 46	PUBLIC COMMENTS: There is insufficient data to evaluate potential ecological hazards and risks. EPA has no information on chronic aquatic toxicity or toxicity to sediment-dwelling organisms. EPA could have required the generation of more ecotoxicity data for PV29 during this risk evaluation, and therefore has failed to consider reasonable available information about ecological hazards. EPA bases its conclusion that PV29 presents no environmental hazard solely on acute aquatic toxicity data. According to EPA's Appendix C listings, those studies only examined one endpoint, mortality. EPA should require the following data – Acute toxicity to sediment-dwelling organisms	EPA acknowledged the uncertainties regarding the lack of environmental hazard data characterizing the effects of chronic exposure to aquatic organisms and hazard data for sediment-dwelling aquatic organisms. Available environmental hazard data for acute exposure indicated a low hazard and the low solubility and low potential for aquatic releases of PV29 led EPA to conclude that additional environmental hazard data is not a critical data need. To reduce the level of uncertainty in the assessment, EPA included Ecological Structure Activity Relationships (ECOSAR; v.2.0) predictive modeling outputs in the final Risk Evaluation to understand the potential hazards of chronic exposure to PV29 to aquatic organisms. The results of this modeling indicate that environmental hazards following chronic exposure are not expected to result at concentrations below the limit of solubility. This provides an additional indication that hazard data for chronic exposure

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
	– Chronic toxicity including to aquatic organisms including aquatic plants, fish, and aquatic invertebrates – Chronic toxicity to terrestrial organisms (including sediment-dwelling organisms) EPA and Environment Canada relied on acute studies. EPA should not presume that toxic levels will not be reached due to low solubility of PV29. This line of argument cannot rule out that there are chronic effects at lower levels. There is no indication that Environment Canada had any chronic toxicity data for the other pigments. EPA should not assume that data from acute aquatic studies can sufficiently address potential chronic aquatic effects for the same chemical. Many chemicals have been shown to exhibit significantly different acute and chronic toxicity values, and these can differ across species for the same chemical. Among other testing, long-term aquatic toxicity testing is needed for PV29 given its persistence, lack of evidence that it is not bioaccumulative, and concerns from EU member countries that it may be PBT or very persistent and very bioaccumulative (vPvB).	are not a critical data need. While PV29 is expected to be persistent, it is not expected to bioaccumulate, and additional data submitted indicate a low solubility in octanol, further indicating a low bioaccumulation potential. In addition to the discussion above about the critical data needs for chronic ecotoxicity data, EPA disagrees with some of the information presented in the ECHA Community Rolling Action Plan (CoRAP) justification document where PV29 is determined to be a potentially Persistent, Bioaccumulative and Toxic (PBT) substance. The justification document (https://echa.europa.eu/documents/10162/c607549c-1c07-c5d6-d6e2-8d18bff91f3a) categorizes PV29 as a potentially bioaccumulative substance because of uncertainties related to the water solubility, $LogK_{ow,}$ and $LogK_{oa}$ of the chemical substance that stems from discrepancies in the predictive modeling outputs, namely between EpiSuite and ACD/Percepta 14.2.0 predictive models. While EPA does agree that PV29 is a persistent chemical, EPA determined that water and octanol solubility data were critical data needs in order to finalize the Risk Evaluation. As a result, EPA issued a TSCA Section 4(a)(2) Test Order for C.I. Pigment Violet 29 on February 28, 2020. This test order compelled the creation and submission of solubility data to clarify these uncertainties. These studies concluded that PV29 exhibits an extremely low solubility in both water and octanol (<0.003 mg/L), which led EPA to conclude that $LogK_{ow}$ is not a relevant property for PV29 (Nicolaou, 2020). In addition, the substance is a solid with a high melting point, so log K_{oa} is not a relevant property for this compound. As indicated above in the "Physical Chemical Properties and Environmental Fate" section, EPA has clarified these uncertainties and does not consider PV29 a PBT substance.

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
Do not ignore Topkat-predicted acute LC50 for fathead minnow		
13	EDF located Environment Canada's specific categorization results for PV29. Those results reveal that the pivotal value Environment Canada used for predicted acute toxicity of PV29 to fathead minnow was an LC50 value of 0.115 mg/L (as predicted by Topkat v6.1). This is lower than water solubility estimates for PV29 that EPA provided in the scoping document (0.169 mg/L). This means that PV29 could reach levels in water sufficient to kill 50% or more of fathead minnows exposed to it, not to mention exerting other non-lethal aquatic effects. EPA should not ignore this pivotal toxicity value.	EPA does not typically rely on modeled toxicity values when empirically-measured toxicity information are available. In the case of PV29, the acute toxicity study with fish indicated that no mortality was observed in test organisms up to the limit of solubility. In addition, the toxicity value used in the screening-level approach described by Environment Canada of 0.169 mg/L is >100x larger than the limit of solubility reported in the water solubility study submitted to EPA in response to the Section 4 Test Order (0.003 mg/L) (Nicolaou, 2020).
Need to better describe how log K_{oc} was determined		
SACC	SACC COMMENT: Provide better description of how log K_{oc} was determined in key studies.	The K_{oc} value was derived by using EPI suite estimation software in the Draft Risk Evaluation document. This estimated log K_{oc} using the K_{ow} which has been determined not to be an applicable property for PV29 based on the low solubility in water and octanol. As a result, log K_{oc} will not be relied upon in the final risk evaluation.
Concerns about ecological hazards for sediment-dwelling invertebrates		
SACC, 13, 75, 80	SACC COMMENT: Include a level of confidence statement with judgements of toxicity to sediment dwelling organisms. PUBLIC COMMENTS: EPA's conclusion that PV29 is "unlikely to present an unreasonable risk to sediment-dwelling, aquatic invertebrates" is unscientific and unreasonable. EPA noted that PV29 was expected to partition to soil and sediment. Therefore, it cannot conclude there is no	The assessment discusses the uncertainties regarding the risk evaluation to sediment-dwelling organisms. The final risk evaluation includes an expanded discussion to help understand the level of confidence in the environmental risk assessment for sediment-dwelling aquatic organisms. EPA believes it has adequate hazard data to evaluate the environmental risks of PV29 to aquatic organisms. EPA used the reasonably available data to assess sediment invertebrates. Because PV29 is not expected to sorb to sediment and demonstrates low solubility indicates, the presence in pore water will be low. *Daphnia*, which feed

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	unreasonable risk to the environment without data on biodegradation and toxicity to benthic organisms. Data from a single acute *Daphnia magna* study cannot be used as a proxy to evaluate potential hazards to all sediment-dwelling invertebrates or other organisms. (Ankley et al., 1993) provides guidance on assessing the toxicity of sediment-associated contaminants. "For example, many researchers use upper-water-column test species, such as cladocerans (which includes *Daphnia*) and fishes, to assess the toxicity of contaminated sediments; however, these organisms are not relevant if species of concern are benthic, particularly in terms of adequately addressing all possible routes of exposure." See also U.S. EPA, Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates (Mar. 2000)	through the entire water column were deemed to be an acceptable surrogate species for sediment invertebrates consistent with EPA/OPP guidance, which lists several considerations for determining the likelihood of exposure and toxicological relevance of exposure to sediment-dwelling organisms (https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/toxicity-testing-and-ecological-risk-assessment). EPA appreciates the submission of the sediment-dwelling organism testing guidance (USEPA, 2000). This reference outlines testing procedures for testing with benthic organisms rather than proposing criteria to determine whether this testing is necessary. As EPA did not determine that toxicity data with sediment-dwelling organisms is a critical data need, this reference was not relevant.
Need for more data to evaluate hazard to terrestrial ecological receptors		
13, 16, 46	PUBLIC COMMENTS: EPA has not identified any studies of potential terrestrial and avian toxicity for PV29, despite the fact that this substance is persistent and released into the environment, including to landfills where it has potential to leach and contaminate soil. Toxicity to terrestrial organisms may differ from aquatic organisms. A 2014 ECHA report notes, "Especially for substances with low water solubility toxic effects may not be detectable through acute aquatic toxicity tests whereas prolonged aquatic exposure and/or tests with terrestrial organisms exposed through soil or food may result in toxic effects."	EPA acknowledged the uncertainties in the assessment with regard to the lack of hazard data for terrestrial organisms. EPA does not consider this a critical data need because conditions of use are expected to result in limited exposure to terrestrial organisms. Potential exposure to terrestrial organisms resulting from disposal to landfills is expected to be low, as the low solubility of PV29 indicates that leaching from landfill is not likely. In addition, the low bioaccumulative potential of PV29 indicates that releases to water are not expected to biomagnify up the food chain, so exposures to terrestrial organisms under the conditions of use of the assessment are not expected.

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	Similarly, a 2014 National Academies report states, "Relative chemical hazards to terrestrial organisms do not necessarily follow the same patterns as that seen with aquatic organisms, necessitating separate testing and assessment schemes." Therefore, the lack of any terrestrial toxicity data for PV29 is a major data gap leading to significant uncertainty.	
Concerns about citing the Canadian Ecological Risk Classification for PV29 as support for determination		
13	PUBLIC COMMENTS: EPA has asserted that PV29 has a low potential for aquatic hazard. In support of this assertion, EPA cited the Canadian Ecological Risk Classification for PV29 (Environment Canada, 2006); however, upon further examination of that source, it does not appear to support EPA's assertion. Canada's categorization exercise was intended only to identify chemicals of potentially high concern, not to also identify chemicals of low concern. In addition, Canadian officials made do with whatever information they already had or could develop rapidly through predictive models. No attempts were made to fill data gaps. Chemicals that Canada found not to meet the categorization criteria should not be characterized as affirmatively low concern. Given the different purpose and limited nature of Environment Canada's analysis, EPA should not rely on that screening process to support a finding of no unreasonable risk for PV29. In EPA's draft risk evaluation, there is mention that Environment Canada made its final ecological risk determination for PV29 using a combination of QSAR modeling and hazard data for analogous pigments with low solubility (e.g., Pigment Red 149). However, neither EPA	The determinations of potential environmental hazard of PV29 made by EPA and Environment Canada are consistent. Due to the limited nature of the Canadian Categorization results that are publicly available, EPA has removed all reference to the determination by Environment Canada regarding ecological hazard from the final Risk Evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
	nor Environment Canada have provided any predicted or measured data for the similar pigments.	
Support for EPA's characterization of hazard to ecological receptors		
17, 19	PUBLIC COMMENTS: No effects were observed in three acute toxicity studies up to the limit of solubility of the chemical. The lines of evidence clearly support EPA's conclusion of low hazard potential to environmental receptors. There are substantial details on ecological hazard data in the studies initially submitted to ECHA and cited by EPA. To enhance clarity in how the data were applied, EPA should consider more clearly linking the robust study summaries available on ECHA's website to the outcome of the risk evaluation. EPA's use of a qualitative approach for ecological exposure assessment is appropriate given the low volume of PV29 material used in finished products (<100,000 pounds) and infrequent use in consumer products. The final risk evaluation should provide additional information on EPA's process for determining the tiered approach it used and why.	This is consistent with the approach presented in the final risk evaluation. The full study reports for the environmental hazard studies for PV29 have been made publicly available in the docket for PV29, so EPA has removed the references to the ECHA study summaries and has based the conclusions of the risk evaluation on the results of the full study reports. EPA does not have a set guidance for when a risk evaluation utilizes a quantitative or qualitative approach. Instead, the determination is made on a case by case basis as a result of reasonably available data and the potential for a given route of exposure to result in a concern. According to 40 CFR 702.41(a)(6)-(7): *"(6) The extent to which EPA will refine its evaluations for one or more condition of use in any risk evaluation will vary as necessary to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment.* *(7) To the extent a determination as to the level of risk presented by a condition of use can be made, for example, using assumptions, uncertainty factors, and models or screening methodologies, EPA may determine that no further information or analysis is needed to complete its risk evaluation of the condition(s) of use."* In the case of PV29, a comparison of the high-end exposures of PV29 to the available environmental hazard data indicated

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
		that risks were not expected and additional quantitative analysis was not necessary.
Concerns about studies where observed exposures exceed water solubility limit		
SACC	SACC COMMENT: Improve explanations for estimates of toxicity benchmarks developed from those studies where observed exposures exceed the water solubility limit.	The reporting of the solubility limit across the environmental hazard studies is inconsistent. For example, the solubility limit in the Zebrafish study (BASF, 1988) is reported as 670 mg/l, while the study with *Daphnia magna* (BASF, 2012) reports a limit of solubility of 0.001 mg/L. This is an uncertainty that is discussed in the final Risk Evaluation. Following the publication of the draft risk evaluation (U.S. EPA, 2018b), EPA identified the uncertainty regarding the limit of solubility of PV29 in octanol and water as a critical data gap for the assessment and issued a TSCA Section 4(a)(2) Test Order for C.I. Pigment Violet 29 on February 28, 2020. These data were submitted to the agency and confirm the low solubility of PV29 in both octanol and water (<0.003 mg/L). The submission of these data clarifies the uncertainties regarding the solubility.

Human Health

Charge Question 6.a: Please comment on the toxicological study which was used to identify the endpoint of concern and derive the associated point of departure (POD). Also, please comment on alternative approaches to estimate the potential for lung effects using analogs for poorly absorbable particles to calculate an inhalation toxicity POD and the screening-level calculation to estimate the potential for lung overload. Please comment on this approach and whether this analog represents useful information to quantify risk for the inhalation route and whether oral developmental study is appropriate for all routes of exposure. If not, please describe what other alternative approaches could be used in lieu of these approaches to serve as the basis for completing the hazard assessment and subsequent risk evaluation for PV29.

Charge Question 6.b: Please comment on the use and interpretation of Multiple-Path Particle Dosimetry Model (MPPD v. 3.04), which has not been formally peer-reviewed, to predict lung deposition of aerosolized PV29.

Charge Question 6.c: Please comment on the evidence available to support the agency's conclusion of negligible absorption via oral, dermal, and inhalation routes.

Charge Question 6.d: Given the varied nature of the consumer uses, please comment on the agency's characterization of hazard to consumers via inhalation and dermal exposure for different durations of exposure.

Charge Question 6.e: Similarly, please comment on the Agency's characterization of hazard to workers via inhalation and dermal exposure for different durations of exposure.

Charge Question 6.f: Please comment on the Agency's consideration of health hazard concerns for potentially exposed susceptible subpopulations given the constraints of the available information (*e.g.*, children, workers, or pregnant women).

#	Summary of Comments for Specific Issues Related to Charge Question 6	EPA/OPPT Response
Support for EPA's approach and conclusions regarding human health risk		
19, 47, 49	PUBLIC COMMENTS: EPA's health hazard determination and decision that guideline studies for each human health endpoint are not necessary for risk determination are adequately supported with data regarding genotoxicity, SARs, and poor absorption. EPA appropriately concluded that it did not need to possess a guideline study of PV29 regarding every conceivable human health endpoint. EPA's cross-route extrapolation of oral route exposure to derive other no-observable adverse effect levels (NOAELs) to address systemic effects is appropriate and is a typical convention of risk assessment practice. The summaries of the 10 short-term assays provided sufficient information and show compliance with OECD test guidelines.	EPA acknowledges these comments and encourages the commenters to consult the final risk evaluation for the most updated risk characterization.
Make hazard conclusions specific to routes of exposure		
SACC	SACC COMMENTS: Wherever in the Evaluation the statement "PV29 has low hazard potential across all possible routes of exposure" occurs, the statement should be replaced with one that is specific and limited to the routes of exposure observed in the available study data—thus allowing new data, as it becomes available, to add to and expand hazard conclusions regarding PV29.	EPA acknowledges this and has updated the language in the final risk evaluation to better tie the risk determinations to the specific conditions of use of PV29. Qualitative statements were replaced with specific statements based on the availability of data.
Clarify value of the screening reproductive/developmental toxicology study and highlight data gaps		
SACC	SACC COMMENTS: Include a table in the Evaluation that compares the endpoints reported in the screening	EPA did not make this change. There is no minimum data set for risk evaluations conducted under TSCA. EPA obtained all reasonably available data for C.I Pigment Violet 29 and

#	Summary of Comments for Specific Issues Related to Charge Question 6	EPA/OPPT Response
	reproductive/developmental toxicological study used in the Evaluation to endpoints typically reported in a 90-day subchronic toxicity study or to compare what's available for PV29 versus a basic SIDS data set–to clarify the value of the screening reproductive/developmental toxicological study and highlight data gaps in the toxicity assessment.	issued a TSCA Section 4(a)(2) Test Order for C.I. Pigment Violet 29 to address critical data gaps in the assessment. Other data gaps, such as inhalation toxicity testing, were addressed by using analogue toxicity data and basic exposure assumptions. The final risk evaluation discusses the limitations of data and data gaps as part of the uncertainty analyses.
The toxicity studies EPA used are unreliable		
8, 10, 12, 13, 14, 16, 46, 48	PUBLIC COMMENTS: EPA uses unacceptable and unreliable studies that present risk of bias to determine inhalation toxicity and chronic health effects and the measurements use for PV29 levels are unreliable. The OECD 421 screening test utilized is flawed and unreliable. It cannot be used to estimate human risk. EPA cannot determine reproductive toxicity hazard based on the current data available and should provide more discussion on reproductive toxicity screening limitations. There are concerns with the quality ratings of the oral toxicity studies due to inadequacies, information gaps, and a protocol that is no longer available online for evaluation. Multiple studies utilized by EPA are inadequate, such as the 10-page report prepared by BASF providing summaries for 10 studies which lack supporting data, and the developmental toxicity study which involved a small number of rats from a single species.	The available PV29 human health hazard studies are evaluated by the guidance and criteria in the *Application of Systematic Review in TSCA Risk Evaluations.* The results of EPA's data quality evaluation of each study is provided in detail in a Supplemental file to the final risk evaluation. EPA agrees that the available inhalation toxicity study for PV29 is unacceptable. However, EPA considers the OECD 421 adequate to determine whether additional reproductive testing is necessary. As no significant adverse effects were observed in the study, EPA believes that this provides justification that no additional reproductive testing is necessary. In the final risk evaluation, EPA assessed the potential inhalation of PV29 dust particles by workers using an analogue chemical (carbon black). Using this analogue and a sub-chronic inhalation study as well as additional information on PV29 dust concentrations in the Sun Chemical Manufacturing workplace, unreasonable risk was identified for several conditions of use. EPA acknowledges that the study reports are often truncated

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		and overly summarized. As this represents the best available data to understand the potential health effects of PV29, EPA utilized the study report results to understand the human health hazards of PV29. EPA has released the full study reports to the PV29 Docket (EPA-HQ-OPPT-2018-0604)
EPA improperly disregarded intraperitoneal studies		
12, 13, 16	PUBLIC COMMENTS: EPA improperly disregarded intraperitoneal studies reporting clinical effects and death. These two studies should not have been rejected as irrelevant but instead treated as reliable because there is a strong scientific basis for treating intraperitoneal dosing studies similarly to oral dosing studies. EPA swiftly discounts evidence of hazard. Toxic effects were observed in intraperitoneal studies, but EPA invoked its problematic low solubility argument. EPA cannot rely on a deeply flawed low solubility-low absorption argument to dismiss the observed effects in those studies.	EPA released an update to the systematic review supplemental file that provided the reviewer comments and updated systematic review data quality evaluation scores in response to comments received from the public. These files are available on the docket for PV29 at: https://beta.regulations.gov/document/EPA-HQ-OPPT-2018-0604-0040 The result of this data quality evaluation found that the intraperitoneal injection studies were of low quality and they were not used qualitatively in the final risk evaluation. The studies were not used because the route of exposure (intraperitoneal injection) is not considered by EPA to be a relevant route of exposure for PV29. There is a great deal of uncertainty about how this type of exposure relates to those associated with the conditions of use expected for PV29. In addition, the concentrations where adverse effects were observed in the test animals (LD_{50}= 7000-9000 mg/kg-bw) is far greater than the NOAEL for reproductive/developmental toxicity of 1000 mg/kg-bw that was used in the screening-level risk evaluation.
EPA did not use data from similar substances		
13, 15	PUBLIC COMMENTS: EPA failed to utilize data on similar substances.	EPA has updated its approach in the final risk evaluation to incorporate analogue toxicity data into the risk characterization for inhalation exposure.

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	An analysis of PV29 through ToxTree provides a structural alert for PV29 given its structural similarity to polycyclic aromatic hydrocarbons (PAHs). EPA completely fails to analyze this structural alert or consider this evidence suggesting that PV29 may be a carcinogen as a result of this similarity.	Empirical data indicates that C.I. Pigment Violet 29 is negative for genotoxicity and structural activity relationships (SAR) considerations support EPA's conclusion that PV29 is unlikely to be a carcinogen. Given the low potential for absorption/ uptake and biodegradability, the relevance of PAHs as a predictor of carcinogenicity are low.
EPA should acquire additional studies due to insufficient data		
SACC, 10, 12, 13, 14, 15, 16, 18, 22, 43, 46, 49, 74, 75, 76, 82	<u>SACC COMMENTS:</u> Request an appropriate study to adequately determine bioavailability or bolster the evidence for poor water and octanol solubility in a well-laid out manner to support the agency's conclusions. The utility of the screening reproductive/developmental toxicological study for deriving the POD would benefit from additional and better estimates of physical/chemical properties and ADME studies to further strengthen support that PV29 has low bioaccessibility/bioavailability and therefore, decreased risk for absorption and inhalation. <u>PUBLIC COMMENTS:</u> There is insufficient data to make a human health hazard determination due to CBI and insufficient testing, including the following topics: PV29 levels, exposure characteristics, absorption, and chronic toxicity. EPA has authority to acquire more "reasonably available data" by requiring additional studies by manufacturers to evaluate human hazard. Specific suggested study types that should need to be included are:	To address the uncertainties identified in the assessment, EPA has issued a TSCA Section 4(a)(2) Test order for the development and submission of additional solubility testing of C.I. Pigment Violet 29 in water and octanol. This solubility testing has been submitted to EPA, and it was determined to be high quality and acceptable for use in the final risk evaluation. This reduces the uncertainty about the preliminary determination that the low solubility of C.I. Pigment Violet 29 results in a low potential for absorption. To further reduce uncertainties related to the screening-level risk analysis of inhalation exposure, EPA decided to use analogue toxicity data to better characterize the hazards to workers from chronic inhalation of C.I. Pigment Violet 29. While there are uncertainties regarding the available data for C.I. pigment Violet 29, EPA has determined that sufficient data exist to make a risk determination for C.I. Pigment Violet 29 under the conditions of use of the assessment. EPA selected the first 10 chemicals for risk evaluation based in part on its assessment that these chemicals could be evaluated without the need for regulatory information collection or development. When preparing this risk evaluation, EPA obtained and considered reasonably available information, defined as information that EPA possesses, or can reasonably obtain and synthesize for use in risk evaluations, considering the deadlines for completing the

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	– High-quality, reliable experimental test results for acute inhalation toxicity. – A 90-day repeated dose toxicity study for oral, inhalation, and dermal routes of exposure. – Chronic mammalian health studies sufficient to account for exposures via dermal, inhalation, and oral routes. – Carcinogenicity studies. – Respiratory/inhalation sensitization studies. – Tests for genetic toxicity/mutagenesis/gene mutation, including in vivo tests for chromosome damage, cytotoxicity, and other relevant endpoints. – Neurotoxicity studies, including developmental stages. – Two generation reproduction toxicity studies. – Studies for acute and chronic endocrine effects. – Pharmacokinetic study measuring distribution in blood and fat and toxicokinetic studies.	evaluation. However, EPA will continue to improve on its method and data collection for the next round of chemicals to be assessed under TSCA.
Increase transparency of evidence used to determine carcinogenic risk		
8, 17	PUBLIC COMMENTS: EPA should provide more detail on the in vitro carcinogenicity assessment, including a description of the structure-activity relationship (SAR) data/programs that were used, how they were evaluated, and why the data strengthens confidence in a low likelihood of carcinogenic risk. In addition, EPA could further describe how the assessment of carcinogenicity includes consideration of other available *in vivo* toxicity studies, in particular, the evaluation of histopathology in repeat dose studies.	The SAR determination for carcinogenicity was based on expert judgement about the carcinogenic potential of functional groups to elicit carcinogenic potential. This determination is supported by the available data for PV29, which was considered in the assessment. This information has been captured in the OncoLogic™ predictive model which is available at: https://www.epa.gov/tsca-screening-tools/oncologictm-computer-system-evaluate-carcinogenic-potential-chemicals
Concerns about route-to-route extrapolation and lack of uncertainty factor		

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10, 12	PUBLIC COMMENTS: EPA incorrectly determined low hazard across all routes of exposure and used an oral exposure study to calculate the point of departure for its analysis of dermal and inhalation risks, but this extrapolation ignores the potential that PV29's absorption rate is lower for oral exposures than for inhalation and an uncertainty factor should have been applied.	EPA acknowledges the uncertainties inherent in utilizing a route-to-route extrapolation to assess the risks from inhalation exposure. As a result, EPA has updated the risk characterization for inhalation exposure to use chronic inhalation toxicity data for carbon black to represent the inhalation toxicity for PV29 following chronic exposure.
MPPD model requires size distribution of PV29 in workplace aerosols		
77	PUBLIC COMMENTS: The MPPD model depends on the particle size distribution, but EPA lacks data on the size distribution of PV29 particles in workplace aerosols.	Through correspondences with the sole US manufacturer of PV29, EPA has obtained additional characterizations of the particle size of C.I. Pigment Violet 29 dust that can represent the potential workplace exposure of C.I. Pigment Violet 29 dust. These particle size distributions have been made public with the final Risk Evaluation as a supplemental file, titled, "*Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a)." For the final risk evaluation the MPPD model was not used due to the uncertainties and incomplete information on the particle size distribution of PV29 in the workplace. The MPPD model also does not have the ability to calculate human equivalent concentrations (HEC) for the hamster. The RDDR dosimetry model was instead used to estimate a HECs based on a carbon black inhalation toxicity study for rats, mice, and hamsters.
Present models or NAMs to improve understanding of absorption potential		
SACC	SACC COMMENTS: Given the low confidence in absorption potential based on limited physical-chemical data, present models based on several solubility scenarios or NAM *in vitro* testing using tissue adsorption models.	To address the uncertainties identified in the assessment regarding the assumptions made about the absorption potential of C.I. Pigment Violet 29 from its solubility, EPA issued a TSCA Section 4(a)(2) Test order for the development and submission of additional solubility testing

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		of C.I. Pigment Violet 29 in water and octanol. This testing was received and reviewed by the agency and found to be of high quality. As a result, EPA has high confidence that the data received as a result of the Section 4 Test Order represents the true limit of solubility of PV29.
Concerns about lack of scientific evidence for EPA's conclusion regarding absorption potential		
8, 12, 13, 16, 18, 46, 55, 77, 78	EPA has no scientific basis for using low solubility to conclude there would be no absorption through the dermal and inhalation routes of exposure, but did not provide confirmatory data, which could have been readily obtained using EPA's section 4 testing authority. EPA should consider basic physicochemical information (*i.e.*, molecular mass and lipophilicity) when determining dermal absorption. EPA ignored the multiple mechanisms by which chemicals, including poorly soluble substances, may be absorbed. EPA should have obtained actual absorption information instead of simply assuming that low solubility will necessarily result in low absorption. EPA did not consider how the presence of other constituents in a PV29 formulation, such as surfactants, can significantly alter the absorbability of PV29. EPA assumes that a lower fraction of PV29 is dermally absorbed than the source it cites as support recommends based on the chemical's properties. Given the inconsistency in the way exposure potential is described, OPPT should clarify exposure assumptions, specifically in applying a consistent approach for potential dermal absorption.	As indicated above, EPA issued a TSCA Section 4(a)(2) Test Order for the submission of water and octanol solubility studies to reduce uncertainties about the available data used in the Draft Risk Evaluation. EPA determined that the low solubility in water and octanol initially reported in the assessment and confirmed by the studies submitted as a result of the Section 4 Test Order was adequate evidence to conclude that absorption of PV29 is low. As there are limited data to indicate that components of the formulations can affect the absorbability of PV29, EPA acknowledges that there are uncertainties about this issue. Given the difficulty of finding a solvent for PV29, it is likely that the stability of the compound is high in all but highly acidic conditions. EPA has updated the final risk evaluation to remove the screening level risk evaluation for dermal exposure presented in the Draft Risk Evaluation. The overly conservative nature of the assumptions in that approach and the route to route extrapolation using the subchronic NOAEC to calculate an MOE for dermal and inhalation hazard meant that the results were of limited utility to actual exposure scenarios, especially for a substance that is as poorly absorbed as PV29. Therefore, the discussion of the inputs used in that approach

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		are no longer relevant.
Consumer hazard is not fully investigated		
SACC 12, 13	SACC COMMENTS: Improve the discussion of the uncertainty surrounding exposures for the general population. Explain clearly why it was initially determined that there were widespread consumer exposures to PV29 but that this did not need to be addressed in the final risk assessment. Clearly acknowledge that there may be certain consumers that receive higher acute and chronic exposures and explain why this is not considered important for this risk assessment. PUBLIC COMMENTS: EPA does not provide evidence to support the expectation that consumer and general population exposures will be lower than worker exposures. EPA has not fully evaluated hazards to consumers. EPA cannot expect that consumers exposed to PV29 will wear protective gear.	EPA acknowledges the uncertainties in its conclusion that risks are not expected for the general population. EPA has high confidence in this conclusion, as a high percentage of PV29 is used as an intermediate and is therefore converted into other chemical substances and not released into the environment. Therefore, PV29 exposure is primarily expected to result in a manufacturing setting and not as a result of exposures to consumers and the general population from downstream uses. Based on the available data to characterize consumer exposures to PV29, the consumer uses are not expected to result in long term inhalation exposure to PV29 dust, which is the primary route of concern for PV29. Exposures from this pathway are expected to result from manufacture, processing and industrial/commercial uses to workers. Regardless, the risk evaluation is updated to better explain potential risks to consumers. EPA calculated risks from occupational exposures with and without the use of PPE. EPA does not assume that consumers will use PPE.
Obtain more occupational hazard data		
SACC 13	SACC COMMENTS: Clearly acknowledge that there are few data to support a confident conclusion that workers would not be exposed, and therefore, not experience human health hazards via dermal and/or inhalation routes. Obtain and incorporate into the Evaluation better (*e.g.*, collected using standard measurement techniques with	EPA in the final risk evaluation identified and considered uncertainties regarding reasonably available information characterizing occupational worker exposures to PV29 dust. The updated human health risk characterization in the final risk evaluation calculates an updated POD based on alveolar inflammatory and proliferative responses following

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	adequate temporal and spatial coverage) data/documentation from the manufacturer on conditions of use, exposures, and potential for worker exposures. Regardless of whether PV29 is bioavailable, more justification is needed to conclude that exposures to dusts in occupational settings do not cause lung depositional events or immunological responses sufficient to cause injury. PUBLIC COMMENTS: Manufacturers must submit all available information on occupational hazard and exposure under the identified conditions of use because EPA must consider all hazards and exposures when preparing risk evaluations.	inhalation observed in an analogue, carbon black (Elder et al., 2005). EPA gathered some information as suggested on the conditions of use, exposures and potential for worker exposures from correspondences with industry stakeholders. In the final risk evaluation this information is included as a supplemental file, titled, "*Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a). In addition, where occupational exposure information was judged to be insufficient, EPA issued a Section 4 Test Order for the generation of workplace dust monitoring data. These data are used in the final risk evaluation to estimate worker exposure to PV29 dust.
Clarify uncertainties and justify conclusions regarding susceptibility		
SACC 8, 9, 10, 12, 13, 14, 16, 77, 78, 82	SACC COMMENTS: Clarify the statement in 3.4.1, "there is no evidence of increased or decreased susceptibility for any given population" to acknowledge that there are large data gaps that preclude coming to confident conclusions regarding certain subpopulations. Do not make statements without additional clarifications and justifications that children or other susceptible populations would be protected. The current data as discussed in the data integration does not clearly support this conclusion and the committee has recommended additional data needs and rationale to address this uncertainty. Some committee members recommended EPA consider an "indeterminate" categorization and qualify with data that may suggest low toxicity. Methods	EPA acknowledges the uncertainties regarding this conclusion and has updated the final risk evaluation to explain these uncertainties. EPA has identified critical data needs and issued a Section 4 Test Order to fulfill these needs. As a result, EPA received additional information and incorporated it into the evaluation. EPA has modified the risk characterization approach to better represent the expected effects of exposure to PV29. While there are remaining uncertainties, EPA is confident that its risk determination is protective of potentially exposed or susceptible subpopulations identified in this risk evaluation. EPA has updated the risk evaluation to discuss uncertainties resulting from lack of data for specific susceptible

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	to address this would include using more uncertainty factors in MOE calculations or developing multiple modeling scenarios including best case to worst case and presenting these models in the text. Improve transparency by acknowledging in the evaluation that there are no data supporting the determination of hazards or exposures to children or other susceptible populations on which to make confident conclusions regarding risk to these susceptible subpopulations. <u>PUBLIC COMMENTS:</u> EPA has not met the TSCA mandate to consider risks to PESS and needs to require additional studies and data collection. The agency did not adequately consider pregnant women, children, and other vulnerable subpopulations, those vulnerable in the workplace, and should apply uncertainty factors in their hazard assessment. A factor of 10 is applied for risk assessments on dietary pesticide ingestion for PESS. EPA should seek the advice of its Children's Health Protection Advisory Committee.	subpopulations including children and other susceptible populations outlined in Section 2.4.1.
There are no vulnerable subpopulations		
45	<u>PUBLIC COMMENTS:</u> There are no vulnerable subpopulations with reasonably foreseen exposures to harmful quantities of PV29. Workers in U.S. manufacturing facilities do not constitute a vulnerable subpopulation.	EPA has updated the risk evaluation to discuss uncertainties resulting from lack of data for specific subpopulations.

Risk Characterization/Risk Determination

Charge Question 7.a: Please comment on whether the information presented to the panel supports these conclusions outlined in the draft risk characterization section concerning PV29. If not, please suggest alternative approaches or information that could be used to develop a risk finding in the context of the requirements of EPA's final rule, *Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act* (82 FR 33726).

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Support for the conclusions in the draft risk characterization		
17, 19, 47	PUBLIC COMMENTS: The risk evaluation relies on conservative, lower-tier screening approaches to risk assessment to support the determination that PV29 does not pose an unreasonable risk of harm to human health or the environment under reasonably foreseeable conditions of use. This is appropriate due to PV29's evidence of low toxicity, largely industrial conditions of use, and low volume of material used in finished products. EPA appropriately considered the full body of toxicity studies, physical-chemical properties, use patterns and relevant routes of exposure, addressed uncertainties, and used an established health-protective approach to calculate risks that accounts for the different routes of exposure. EPA utilized conservative assumptions and highly protective default values for risk characterization. Even so, EPA found no unreasonable risk. EPA collected more than enough data to support its risk evaluation and appropriately concluded that a guideline study is not needed for every conceivable human health endpoint. EPA's conclusions confirm those contained in the published EU Registration, Evaluation and Authorization of Chemicals (REACH) summaries. Further assessment of PV29 would not yield any benefit for EPA, consumers, industry or workers. EPA's limited risk evaluation resources should be directed to substances for which reasonably foreseeable conditions of use pose a high potential for unreasonable risk.	This comment was received on the draft risk evaluation. The revised and final risk evaluations by EPA have found unreasonable risk associated with PV29.

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	Despite the changes to these quality scores [after the first round of comments], the risk evaluation is not impacted for the following reasons. First, high-quality studies also exist for both acute oral toxicity and eye irritation. Second, EPA has evaluated the remainder of the studies used for the risk evaluation to be of medium- and high-quality, including biodegradation and aquatic toxicity studies, which address the limited water solubility. Third, EPA uses the high-quality reproduction/developmental toxicity study to identify the no-observed-adverse effect level (NOAEL) that is used in the MOE calculations.	
The conclusions in the draft risk characterization are flawed due to lack of data		
SACC, 10, 11, 12, 13, 14, 16, 44, 46, 55, 74, 75, 77, 80	<u>SACC COMMENTS:</u> Saying that no unreasonable risks for PV29 were identified may reflect the weakness and limitations of the database. Lack of evidence isn't evidence. [Note: refers to data gaps.] <u>PUBLIC COMMENTS:</u> EPA relied on inadequate hazard and exposure data to determine that PV29 does not present an unreasonable risk of injury to human health or the environment. In addition, the draft risk evaluation contains numerous logical flaws and unwarranted assumptions, rendering its final conclusion unsupported by substantial evidence, as required under TSCA.	When preparing the draft, revised draft and final risk evaluations, EPA obtained and considered reasonably available information, defined as information that EPA possesses or can reasonably generate, obtain and synthesize for use in risk evaluations, considering the deadlines for completing the evaluation. Along this process, EPA continued to improve the methods and data collection. The resulting final risk evaluation considers reasonably available information and the use of the best available science. Unreasonable risk was identified for several conditions of use for occupational exposures to PV29 via inhalation.

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	The resulting draft risk evaluation fails to consider reasonably available information or to use the best available science. A lack of information does not mean that there is no or low exposure or hazard. EPA improperly inferred the absence of risk from the absence of information. EPA has based its conclusion of "no unreasonable risk" on claims of low exposure, low bioavailability, and low toxicity observed only in short-term studies. These data seem to support a hypothesis of low risk but are woefully insufficient to establish it. EPA concludes that PV29 is not carcinogenic on the basis of insufficient information and unsupported assumptions. The new information that has now been made available [referring to the release of the full studies] further demonstrates the poor quality and limited scope of the data in the draft evaluation and underscores the lack of evidence to support a finding that PV29 does not present an unreasonable risk of injury.	
EPA should order the development and submission of additional information		
SACC, 9, 55, 76, 77, 80, 82	<u>SACC COMMENTS:</u> If it is not possible to arrive at an "indeterminate" conclusion, EPA could conclude that the limitations in the data are sufficient to conclude an "unreasonable risk" and, as a regulatory response, order the manufacturer to develop a limited set of new data, the development of which would not be time limited. The Agency needs to compel answers to these questions if they are to accurately assess the potential human and environmental hazards. Such questions include long-term effects of PV29	In response to uncertainties resulting from lack of data identified in public and SACC comments, as well as in the risk evaluation, EPA issued a TSCA Section 4(a)(2) Test Order for PV29 on February 28, 2020. This test order compelled the creation and submission of three studies by the sole U.S. manufacturer of PV29, Sun Chemical Corporation to address critical data gaps identified in the risk evaluation. EPA is currently working to identify data deficiencies earlier in the prioritization/risk evaluation process. TSCA section 6 requires EPA to determine within a specified period of time whether a chemical substance presents an unreasonable risk of injury to

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	exposure, apparent lack of consensus regarding PV29 solubility, and data gaps regarding characteristics and fate of PV29. PUBLIC COMMENTS: The Agency had ample opportunity to use TSCA authorities to obtain additional hazard and exposure data that could have supported a defensible risk evaluation – as Congress intended – yet refused to do so, instead reaching categorical conclusions about the absence of risk that simply cannot be supported by the inadequate data in the record.	health or the environment. The uncertainties identified were in regard to reasonably available information characterizing PV29's solubility and occupational worker inhalation exposure. Test data were received and reviewed for data quality according to the relevant data quality evaluation metrics and incorporated into the final risk evaluation. The studies received by EPA in response to this Section 4 order included solubility of PV29 in water and octanol, as well as a workplace monitoring study of particles not otherwise regulated, conducted according to the NIOSH 0600 guideline. More information about this test order can be found at: **https://beta.regulations.gov/document/EPA-HQ-OPPT-2020-0070-0008**
EPA's reliance highly uncertain fate and persistence information casts doubt on its risk conclusions		
13, 46, 55	PUBLIC COMMENTS: EPA fails to acknowledge and address serious limitations and uncertainties associated with several of its characterizations of PV29's physical-chemical and environmental fate properties that it relies on to conclude low risk. EPA relies heavily on a single, poorly documented value for water solubility while failing to account for other available data on water solubility. This reliance on a highly uncertain value casts major doubt on all of EPA's risk conclusions. EPA's risk conclusions fail to address the implications of the very high persistence of PV29 in the environment. EPA relies upon modeled values derived using an estimation program lacking sufficient data on similar chemicals.	As discussed above, EPA issued a TSCA Section 4(a)(2) test order to generate more data that address uncertainties related to the physical-chemical properties of PV29, particularly the uncertainty regarding the solubility studies. These solubility data were used to reduce uncertainties stemming from the low confidence ratings of the solubility data presented in the draft risk evaluation. EPA acknowledges the persistence of PV29 but based on the low potential for bioaccumulation and low toxicity, the persistence does not result in specific risk concerns.
Criticism of the margin of exposure (MOE) approach and clarity		
SACC 8, 10,	SACC COMMENTS:	EPA acknowledges these comments and has attempted to explain the additional assumptions used in the calculations of the MOEs in the final Risk Evaluation. This includes selecting

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12, 14, 16, 46, 48, 77	Either do not perform MOE calculations or clearly qualify assumptions used in the MOE calculation based on the limited data. <u>PUBLIC COMMENTS:</u> EPA should not use MOE as an analysis method in the risk evaluation process. MOE is not an estimate of risk, it is a single number that is a version of the "bright line" approach. This approach does not provide information about the magnitude of the risks above, at, or below the line. Further, it implies that there is a "safe" level of exposure below which no harm will occur. While this may be true for a select few chemicals, the NAS Science and Decisions report recognizes that this is not a valid assumption for all chemicals and has recommended moving away from such "bright line" approaches which do not establish risk estimates across the full range of exposures. Additionally, the MOE will not provide the necessary information for future analysis of risks and benefits that will be critical for decision-making on these chemicals. We recommend that EPA utilize available analytical methods, such as PODs based on a Benchmark Dose, to develop quantified estimates of risk. The results from the MOE approach does not adequately account for humans that may be more susceptible to chemical toxicity, and an uncertainty factor should be considered. EPA incorrectly relied on a single studies or data points to base elements of their risk determination. In response to FOIA requests and our initial comments, EPA has failed to provide any supporting data or other justification for the critical workplace air concentration on which its MOE	uncertainty factors that are more appropriate given the limitations of the reasonably available data for PV29. To increase transparency, EPA has compiled the available data and correspondence received from the sole US manufacturer, Sun Chemical Corporation into a single supplemental file. This supplemental file has been uploaded to the docket with the revised draft and final risk evaluation.

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	calculation is based, further weakening its assertion that workers and other exposed populations are not at risk of harm.	
Supports EPA's use of the MOE approach		
17	The PV29 MOE assessment is evidence of the utility of EPA's risk assessment approach in appropriate cases. This commenter supports EPA's use of an MOE approach to assess non-cancer risk.	EPA acknowledges the comment and encourages the commenter to consult the updated risk characterization approaches in the final risk evaluation.
Concerns about CBI affecting the risk characterization		
SACC	SACC COMMENTS: EPA should continue to encourage data submitters to review CBI claims closely prior to submission. EPA should consider novel ways to make full study reports available to interested members of the public without compromising the investment of the data owner.	EPA understands the uncertainties that arise when data are not publicly available due to CBI claims. EPA will work with stakeholders to ensure that relevant data are made available while adhering to the applicable legal requirements regarding confidential business information.
Need to apply additional uncertainty factors		
8, 10, 12, 13, 77, 80	SACC COMMENTS: Include the subchronic-to-chronic uncertainty factor in the calculations of the MOE or significantly improve the justification/qualifications in the Evaluation for why this uncertainty factor should not be used. PUBLIC COMMENTS: EPA failed to apply the necessary uncertainty factors to account for the many data gaps in the PV29 human hazard database of studies. Additional 10-fold uncertainty factors that EPA should have considered include: database deficiencies, extrapolation from short-term to chronic exposures, extrapolation from oral to inhalation and dermal exposures, and vulnerable subpopulations (pregnant women, infants and children).	EPA updated the risk evaluation so that the route to route extrapolation used to characterize risks from inhalation and dermal exposure of PV29 presented in the draft risk evaluation is no longer included in the final Risk Evaluation for human health. In place of this assessment, which was determined not to be appropriate based on feedback provided through public and interagency comments, EPA has chosen to focus on the effects of PV29 particle inhalation following chronic exposure. Based on available data characterizing the effects of particles using an analogue with a similar size, density and solubility as PV29, the most relevant effect from inhalation of PV29 is the inflammation and proliferative responses in the alveolar region of the lung following overloading of lung clearance mechanisms. As a result, the discussion of the application of uncertainty factors to account for the subchronic oral NOAEC to calculate an MOE is no longer relevant.

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	EPA OPPT should use an adjustment factor for intraindividual variability. EPA used an oral exposure study to calculate the point of departure for its analysis of dermal and inhalation risks, but this extrapolation ignores the potential that PV29's absorption rate is lower for oral exposures than for inhalation and an uncertainty factor should have been applied. Even adding a single additional uncertainty factor would result in a benchmark value exceeding the MOE that EPA calculated for worker dermal exposure. If EPA had applied all of the appropriate uncertainty factors, the benchmark MOE would have far exceeded the acceptable margins of exposure and EPA would have concluded that PV29 presents an unreasonable risk to human health.	There is no universal list of hazard data required when evaluating chemical risks under TSCA. Furthermore, for PV29, EPA has sufficient, reasonably available hazard data and included the use of an analogue to support the use of the chosen hazard endpoints and conduct the risk evaluation. Therefore, EPA did not use a database uncertainty factor in the PV29 risk evaluation. Discussions about the use of uncertainty factors in this assessment have been included in Section 4 of the final risk evaluation.
Use of intraspecies uncertainty factor was conservative		
8	PUBLIC COMMENTS: The point of departure (POD) was selected from a reproductive and developmental screening study. Considering this study design evaluates hazards to potentially sensitive subpopulations, an additional factor for interindividual variability may not be necessary. We request OPPT acknowledge the conservatism of this approach and consider potential redundancy in adjustments for sensitive populations via an adjustment factor for intraindividual variability.	This comment is related to an earlier draft prior to the use of carbon black as an analogue and the selection of a POD based on the subchronic inhalation study by Elder et al. (2005). It is acceptable standard practice in risk assessment to have a composite UF of 100 based on interspecies and intraspecies UF of 10 each. In order to reduce the UF_H (intraspecies), you would need confidence that your POD is relevant to the most sensitive PESS. While it may be that it is based on the most sensitive endpoint in the most sensitive species tested, that may not equate to the lowest PESS among the human population. Therefore, the UF_H of 10 is retained.
Occupational risk characterization is flawed		
11, 12, 13, 18	PUBLIC COMMENTS: It is wrong and inconsistent to use personal protective equipment (PPE) and safety data sheets (SDSs) as a baseline	EPA's approach for developing exposure assessments for workers is to use reasonably available information and expert judgement. EPA considers each condition of use and

#	Summary of Comments for Specific Issues Related to Charge Question 7	EPA/OPPT Response
	for risk determination. Risk should be assessed on the basis of health impacts. PPE is not a basis for risk; it is a means to control the risk. There is no OSHA requirement for employers to follow the recommendations of SDSs. EPA should mandate worker protections for PV29 consistent with agencies specializing in occupational safety and health regulation and research (*e.g.*, OSHA and NIOSH). Even with using one uncertainty factor for dermal exposure, EPA cannot conclude that PV29 does not present an unreasonable risk to workers.	constructs exposure scenarios with and without PPE that may be applicable to particular worker tasks on a case-specific basis for a given chemical. For the purposes of determining whether a condition of use presents unreasonable risks, EPA incorporates assumptions regarding PPE use based on information and judgement underlying the exposure scenarios. These assumptions are described in the unreasonable risk determination for each condition of use, in Section 5.2. While EPA has evaluated worker risk with and without PPE, as a matter of policy, EPA does not believe it should assume that workers are unprotected by PPE where such PPE might be necessary to meet federal regulations, unless it has evidence that workers are unprotected. For the purposes of determining if a condition of use presents unreasonable risks, EPA incorporates assumptions regarding PPE use based on information and judgement underlying the exposure scenarios. These assumptions are described in the unreasonable risk determination for each condition of use, in Section 5.2. EPA updated the approach to characterize the risks of dermal exposure to PV29. This screening level assessment of risks from dermal exposure presented in the draft risk evaluation was extremely conservative and not representative of actual exposure under the conditions of use. Dermal exposures were not quantitatively evaluated in the final risk evaluation based on PV29's insolubility, no adverse effects at 1000 mg/kg/day via oral dosing and probable poor absorption across the skin.
Need to expand the risk characterization narrative		
8	<u>PUBLIC COMMENTS:</u> EPA did not sufficiently describe the thought process and rationale that led to the conclusion of no unreasonable risk for PV29. There are concerns about how this method will be applied to future chemical risk evaluations. OPPT should	To increase the transparency and clarity of the process used to arrive at the risk determinations, EPA tied each risk determination in the final risk evaluation for PV29 to a condition of use and explained the uncertainties involved.

#	Summary of Comments for Specific Issues Related to Charge Question 7	EPA/OPPT Response
	expand the narrative in the risk evaluation document to more clearly describe how the available information supports its findings, particularly with regard to determining that the evidence was sufficient for a risk determination.	
Need additional guidance on when higher-tier assessments will be triggered for future risk evaluations		
17	PUBLIC COMMENTS: Additional guidance, developed with stakeholder engagement, would be helpful for future risk evaluations, especially regarding tiered approaches to assessment, occupational exposure assessment, and systematic review. In particular, additional guidance from the Agency on how and when higher-tier assessments will be triggered would be helpful for future risk evaluations.	As discussed above, in Section 4, EPA is not planning to develop a guidance for a tiered approach to Risk Evaluation. Each chemical is assessed using a fit-for-purpose approach that depends on the reasonably available information and conditions of use specific to each chemical. This is consistent with the flexibility afforded to EPA for this risk evaluation process, as explained in 40 CFR 702.41(a)(6) and (7), which explains: (*6) The extent to which EPA will refine its evaluations for one or more condition of use in any risk evaluation will vary as necessary to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment.* *(7) To the extent a determination as to the level of risk presented by a condition of use can be made, for example, using assumptions, uncertainty factors, and models or screening methodologies, EPA may determine that no further information or analysis is needed to complete its risk evaluation of the condition(s) of use.*

Supplemental Analysis

Charge Question 8.a: Please comment on whether the use of point of departure from analog data used in conjunction with the adjusted NIOSH-recommended exposure limit or the Occupational Safety and Health Administration (OSHA) standard for Particles Not Otherwise Regulated (PNOR) to develop an MOE provides utility in risk characterization concerning PV29. If not, please suggest alternative approaches or information that could be used to incorporate these values into the human health risk characterization.

Charge Question 8.b: Please comment on whether the screening-level estimate for the potential for lung overload with the NIOSH-recommended exposure limit or the Occupational Safety and Health Administration (OSHA) standard for Particles Not Otherwise Regulated (PNOR) and the predicted deposition fraction to the alveolar region predicted by the MPPD model (v3.04) from Orberdörster (1994), and whether this provides utility in risk characterization concerning PV29.

Oberdörster, G. (1994). Lung particle overload: implications for occupational exposures to particles. *Regulatory Toxicology and Pharmacology*, *21*(1), 123-135

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
EPA needs more current and/or accurate inhalation exposure data		
SACC	SACC COMMENTS: Given that no acceptable inhalation toxicity studies are available for PV29, a properly designed inhalation study (*e.g.*, 28-day, aerosol, nose only, inhalable fraction with the high dose achieving toxicity which may be lung overload) would be needed to fill this data gap. PV29 is assumed to not be bioavailable or readily absorbed by any applicable route of exposure since it may have poor water and lipid solubility. No absorption, distribution, metabolism, elimination (ADME)/toxicokinetic data were presented. However, mouse skin staining was observed after dosing by intra-peritoneal injection, gavage, and dermal application. The mechanism for this has not been ascertained. NAMs such as Organ on a Chip (lung) or skin permeability in vitro assay should be considered.	EPA agrees that there are uncertainties inherent in making a determination about respiratory hazard without available inhalation toxicity data for PV29. However, as discussed in the final risk evaluation, with the new data obtained through the Section 4 test order to evaluate the solubility of PV29, EPA has a greater degree of confidence that it is poorly absorbed by dermal or oral ingestion exposures. Therefore, based on evidence that suggests chronic inhalation of particles can accumulate in different pulmonary regions, EPA has determined that inflammatory and proliferative responses to lung particle accumulation is a relevant effect for PV29 (U.S. EPA, 2019). As chronic inhalation data are available for Carbon Black, another pigment with low solubility, a similar particle diameter and relative density, EPA determined that these data are adequate to understand the potential hazards of chronic inhalation of

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
	Supplement available data by requesting personal monitoring data from the manufacturer which should include both respirable dust fraction and total dust.	PV29 and no additional inhalation toxicity data are needed. The staining effects are poorly explained in the assessments. However, with the submission of the new solubility data that confirms the low solubility of PV29 in water and octanol and as a result, the low potential for absorption. EPA determined that the observed staining effects (which are inconsistently reported) are not representative of the chemical, but of issues with the way the studies are conducted. Regardless, these staining events did not result in adverse effects to the test organisms in the cases of oral and dermal exposure. EPA requested and received additional respirable dust monitoring data from the Sun Chemical Corporation. This data has been incorporated into the final risk evaluation.
Supplemental inhalation analysis improves risk evaluation, but clarify sources of uncertainty		
73	PUBLIC COMMENTS: EPA's updated inhalation risk characterization of PV29 provides additional rigor to the risk evaluation demonstrating low risk in occupational settings. EPA could, however, provide additional clarity by tabulating sources of uncertainty within the different MOE calculations.	EPA has added language to the final risk evaluation to better describe the sources of uncertainty.
Supplemental inhalation analysis is inadequate		
55, 78, 82	PUBLIC COMMENTS: The New Inhalation Analysis is inadequate to evaluate PV29's inhalation risks and rests upon unsupported assumptions and an unvalidated, non-peer reviewed model. EPA assumes that Pigment Violet 29 is non-toxic and not absorbed via inhalation without providing adequate empirical data to support such assumptions and because of these major data gaps, EPA's new occupational inhalation analysis fails to demonstrate that PV29 is not risky.	EPA agrees that the inhalation analysis presented in the update to the draft risk evaluation is inadequate based on data received to characterize the inhalation potential of PV29. EPA has updated the final risk evaluation to better explain the assumptions and modeling approach. EPA acknowledges that the lack of inhalation toxicity data for PV29 is an uncertainty. EPA is confident that, based on the physical chemical properties of the analogue Carbon Black, it is sufficiently similar to PV29 to be able to

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
	EPA's New Inhalation Analysis does not explain why EPA selected the screening-level lung overload calculation or discuss any uncertainties associated with the formula and its application to PV29. EPA's inhalation risk calculations based on the barium sulfate study are unsupported and underestimated.	adequately describe the inhalation hazards. EPA has updated the explanation of why it selected the screening-level lung overload calculation and has expanded the discussion of any uncertainties associated with this approach in the final risk evaluation. EPA has updated the inhalation approach in the final risk evaluation with an analogue that is more representative of the physical chemical properties of PV29.

Peer Review Comments on Whether or Not Information in the CBI Materials Was Accurately Reflected in the Publicly Available Summaries

Charge Question 9: Please comment on whether or not the information contained in the CBI materials provided to the panel is accurately reflected in the sanitized data that are made publicly available and robust summaries used in the risk evaluation for PV29.

#	Summary of Comments for Specific Issues Related to Charge Question 9	EPA/OPPT Response
Include justifications for redactions by companies		
SACC	SACC COMMENTS: The Committee suggested EPA develop a protocol to include justifications [of redactions by companies] when providing the CBI materials.	For information reported to or otherwise obtained by EPA under TSCA, EPA currently requires CBI claims to be substantiated in accordance with TSCA sec. 14(c)(3) at the time the information is submitted, unless the information is exempt from upfront substantiation under TSCA sec. 14(c)(2). For information that is not reported to or otherwise obtained by EPA under TSCA, EPA requires CBI claims to be substantiated in accordance with the procedures set forth in 40 CFR Part 2, Subpart B.
Provide summaries of differences between full and redacted study reports		
SACC	SACC COMMENTS: The Committee suggested providing, for each study involving CBI, a summary of the differences between the full study report and the redacted study report, with a focus on what information/data is critical to the assessment and how redactions could affect this information.	EPA acknowledges that this approach would be useful in future assessments where critical data are not publicly available as a result of CBI determinations. In the case of the data available for PV29, this is not necessary. Of the 24 studies initially claimed in full as CBI, 15 were released completely without redactions, and 8 study reports were released with partial redactions that do not affect the study details (redactions were only applied to the contact information of the laboratory staff and company). In the instance of the sub chronic toxicity study, the CBI claims were applied to the individual animal data tables and not the result summaries. Upon comparison of the fully unredacted and partially redacted study reports, EPA determined that the redactions did not apply to critical study details and therefore did not affect the ability of a reviewer to understand the results of the study. The study reports can be found in the

#	Summary of Comments for Specific Issues Related to Charge Question 9	EPA/OPPT Response
		docket for PV29 (EPA-HQ-OPPT-2018-0604).
Allow certain parties to examine full study reports		
SACC	SACC COMMENTS: The Committee suggested that EPA come up with a means to allow certain parties to examine full (unredacted) studies.	EPA will explore this in cases where future assessments rely on information protected by CBI claims.

Other Peer Review Comments

Charge Question 10: Comments that do not fit into the other charge questions.

#	Summary of Comments for Specific Issues Related to Charge Question 10	EPA/OPPT Response
82	The implementation of the Lautenberg Act has deviated dramatically from Congress' intent and the new law's requirements.	EPA is committed to implementing the Lautenberg Act and welcomes continued specific input to improve the process of implementation.

Comments on the Revised Draft Risk Evaluation for C.I. Pigment Violet 29 (PV29)

List of Comments Submissions

Comments Received During Public Comment Period Ending on 12/19/2020		
105	EPA-HQ-OPPT-2018-0604-0105 EPA-HQ-OPPT-2018-0604-0103	David Wawer, Executive Director, Color Pigments Manufacturers Association, Inc. (CPMA)
106	EPA-HQ-OPPT-2018-0604-0106	Jared Rothstein, Society of Chemical Manufacturers & Affiliates (SOCMA)
108	EPA-HQ-OPPT-2018-0604-0108	Julia M. Rege, Vice President, Energy & Environment, Alliance for Automotive Innovation
109	EPA-HQ-OPPT-2018-0604-0109	Riaz Zaman, Counsel, Government Affairs, American Coatings Association (ACA)
110	EPA-HQ-OPPT-2018-0604-0110	Liz Hitchcock, Director, Safer Chemicals Healthy Families (SCHF) & National Resources Defense Council (NRDC)
111	EPA-HQ-OPPT-2018-0604-0111	Swati Rayasam, et al., Program on Reproductive Health and the Environment Department of Obstetrics, Gynecology and Reproductive Sciences University of California, San Francisco
112	EPA-HQ-OPPT-2018-0604-0112	Suzanne Hartigan, American Chemistry Council (ACC)
113	EPA-HQ-OPPT-2018-0604-0113	Michelle Roos, Environmental Protection Network (EPN)
119	EPA-HQ-OPPT-2018-0604-0119	Richard A. Denison, Environmental Defense Fund (EDF)
120	EPA-HQ-OPPT-2018-0604-0120	Brett Fox, International Union, UAW
121	EPA-HQ-OPPT-2018-0604-0121	Jen Jackson, Toxics Reduction & Healthy Ecosystems Program Manager, San Francisco Department of the Environment

#	Summary of Public Comment	EPA/OPPT Response
Particle Size Distributions in the Assessment Are Not Representative of the Behavior of PV29		
105	The smallest particle size evaluated in the draft risk evaluation is not representative of PV29 dust particles in the workplace. It is physically impossible for such particles to remain separate without complex engineering. It is physically impossible for PV29 to be present in the workplace in the predominant form of such small dust particles. Like virtually any solid material, very small particles of PV29 will naturally form agglomerates that are more accurately characterized by the two larger particle sizes evaluated in the draft risk evaluation (10.4 and 46.9 µm). The second particle size analysis was designed and conducted specifically to measure the types of the particles that might be present in workplace dust. This was generated very simply: a sample of dry pigment, unprepared, was charged directly into an instrument, compressed air was blown through it to simulate the effect of being released into turbulent workplace air, and a laser was shined through the cloud to measure particle size. This measurement thus more closely represents the sort of PV29 particles that might be found in the workplace environment at a manufacturing or processing site. EPA did not give CPMA or Sun any indication that it did not understand the information provided by Sun, or that EPA was uncertain about its relevance to workplace conditions.	The information provided by CPMA to explain the discrepancies observed in the particle size measurements in the workplace provides no additional information or evidence beyond what was provided to EPA in earlier correspondence (available in the Supplemental File: Information Received from Manufacturing Stakeholders (U.S. EPA, 2020a). CPMA simply reiterated its previous inadequately-substantiated claims that, *The smaller particle size initially supplied by CPMA and relied on in the risk evaluation is not representative of PV29 in workplace dust*," and, "*By contrast, the larger particle size measurements subsequently provided by CPMA, and previously supplied by BASF, are representative of the agglomerated PV29 particles that might be found in workplace dust*." Simply stating that one dataset is more representative of workplace dust without actually presenting any empirical support to verify these claims is not sufficient for EPA to discount the existing particle size information. Additional information that actually measures the particle size of airborne particles found in the workplace would provide sufficient evidence to clarify the uncertainties about workplace dust characteristics. The explanation about the design of the sample used to calculate the 10.4 um particle diameter sample is inadequate. "*This was generated very simply: a sample of dry pigment, unprepared, was charged directly into an instrument, compressed air was blown through it to simulate the effect of being released into turbulent*

#	Summary of Public Comment	EPA/OPPT Response
	The smaller particle size initially supplied by CPMA and relied on in the risk evaluation is not representative of PV29 in workplace dust and is not physically self-sustaining in the ambient workplace environment. Because workplace exposure is limited to agglomerated pigment particles, there is no condition of use which could result in a significant exposure to primary PV29 crystals. By contrast, the larger particle size measurements subsequently provided by CPMA, and previously supplied by BASF, are representative of the agglomerated PV29 particles that might be found in workplace dust. It would be arbitrary and capricious for EPA to rely on that smaller particle size in the final risk evaluation. Finally, we note that the inherent tendency of particles to form agglomerates that are 2-3 orders of magnitude larger than the primary particles is true of pigments generally; indeed, it is true of any chemical substance which forms very small, stable particles.	*workplace air, and a laser was shined through the cloud to measure particle size.*" This provides context but it does not provide adequate empirical evidence to conclude that this sample is representative of dust encountered in manufacturing settings. EPA also agrees with several other comments received by other commenters as well as members of the SACC that 1) the dust samples analyzed by Sun Chemical are taken from the product bags and may not be representative of the PV29 PSD in the workplace breathing zone and 2) smaller particle sizes are more likely to occur within the breathing zone and potentially remain suspended in air compared to larger particle diameter sizes. In addition, this claim that the diameter of PV29 particles found in the workplace is most accurately represented by the larger measurements (10.4 and 46.9 µm) ignores the median particle diameter measurement of 0.5 µm presented in the BASF Safety Data Sheet (available in the Supplemental File: Information Received from Manufacturing Stakeholders (U.S. EPA, 2020a). The particle diameter presented in this SDS is also inconsistent with CPMA's assertion that 10.4 and 46.9 µm are representative of workplace dust. As a result, EPA will not change its determination that PV29 is potentially represented by all particle size information identified and received during the risk evaluation process. EPA has updated its modeling approach in the final risk evaluation. The particle size information is used primarily to judge the appropriateness of the carbon black analogue used to describe the potential hazards of PV29 inhalation. The MPPD model presented in the earlier draft of the risk evaluation to estimate the % deposition of PV29 based on the different particle size

#	Summary of Public Comment	EPA/OPPT Response
		distribution data is no longer part of the final risk evaluation.
112	The significant efforts that are necessary to produce these smallest particles are not conditions that occur normally in a plant setting and should not be considered reasonably foreseeable conditions of use. Thus, best available science indicates that the smallest particle size is not representative of dust that workers would be routinely exposed to, and therefore should not be used as the driver for unreasonable risk.	As discussed above, the justification provided by CPMA to explain the relative applicability of the PV29 particle size distribution data provided by Sun Chemical and CPMA are lacking empirical data. Therefore, there is insufficient evidence for EPA to disregard the potential occupational exposures to PV29 dust at the smallest particle sizes (diameter of 0.043 µm; as provided by Sun Chemical)). As explained in Section 3.2.3.1 of the final risk evaluation, EPA has updated its modeling approach so that the potential exposures are not calibrated for the % deposition as predicted by MPPD based on particle size distribution. Instead, the particle size distribution data are used to justify the use of carbon black as an analogue and to describe the "respirable" size of the particles.
119	Given this enormous range and the continuing uncertainty associated with the levels in and physical forms of PV29 in workplace air across the lifecycle, EPA appears quite appropriately to have based its risk determinations on the smallest particle size from among these widely varying industry estimates.	EPA agrees with the commenter and has not changed in the final risk evaluation, its assumptions about the possibility for exposure to the smallest particle size diameter particles of PV29 in the workplace. Please see Section 3.2.3.1 of the final risk evaluation for the updated hazard discussion.
119	EPA should not discount the smaller particle size diameter measurements in its risk calculations.	EPA agrees with the commenter and has not changed in the final risk evaluation, its assumptions about the possibility for exposure to the smallest particle size diameter particles of PV29 in the workplace. Please see Section 3.2.3.1 of the final risk evaluation for the updated hazard discussion.
Lung Overload as the Critical Endpoint for Occupational Inhalation Exposure		

#	Summary of Public Comment	EPA/OPPT Response
111	EPA must consider all relevant health endpoints of its analogue, Carbon Black, not just lung overload.	The EPA agrees with this comment. The Agency has edited the text of the final risk evaluation in Section 3.2. EPA describes that particle overload is a kinetic phenomenon and the term does not necessarily describe an adverse effect. The definition of overload and how it is used to create context for the evaluation of any observed toxicities has also been provided in the final risk evaluation in Section 3.2.3.1. EPA has updated the human health hazard section to discuss the non-cancer adverse effects observed in rats, mice and hamsters as a result of inhalation of carbon black particles (the analogue for PV29) including alveolar hyperplasia, inflammatory and morphological changes in the lungs.
105	Lung overload is not relevant to humans, and workplace exposure to PV29 does not cause chronic lung disease. The revised draft risk evaluation bases all of its determinations of unreasonable risk on "lung overload," a health effect nowhere discussed in the initial draft. At the outset, CPMA notes that PV29 particles are not present in the workplace in respirable sizes (*i.e.*, < 10 µm), and so this effect is not relevant to this evaluation. The revised draft considers lung overload strictly as a "non-cancer effect." By doing so, EPA is implicitly excluding lung overload as a precursor event, with cancer as the endpoint of concern. Rather, the draft risk evaluation merely describes lung overload "as when the exposure concentration is sufficiently high or the duration sufficiently long to overwhelm alveolar macrophage (AM)-mediated clearance." This implies workers with different patterns of intensity of exposure (concentration) and duration of	The Agency has corrected the text to provide clarification of the kinetic effects observed in the chronic inhalation study conducted with carbon black (alveolar hyperplasia, inflammatory and morphological changes in the lungs in rats). The definition of overload and how it is used to create context for the evaluation of any observed toxicities has also been provided. As indicated above, available evidence provided to describe the particle size of PV29 is insufficient to conclude that particles <10 µm will not be present in the workplace. This physical chemical properties of PV29 (particle size, solubility, solid state) support the conclusion that concerns for potential effects resulting from lung overload by poorly soluble particulate matter, are key hazard concerns for this chemical. There is a lack of scientific consensus about whether lung overload causes cancer in humans. However, inhalation of

#	Summary of Public Comment	EPA/OPPT Response
	exposure are assumed to have the same risk if the product of intensity of exposure (concentration) and duration of exposure are the same. The toxicological literature shows that rat data on lung overload is not relevant to humans. Elder et al. (2005) does not evaluate what other adverse health effects might follow from impaired lung clearance, nor its relevance to humans. Elder et al. (2005) and other relevant publications were reviewed, with the following conclusions: Target organ effects at higher doses are lung inflammation, hyperplasia, and fibrosis (Carter et al., 2006; Elder et al., 2005; Driscoll et al., 1996). However, this response in rats under conditions of lung overload is principally a species-specific response that is not relevant to humans… There is no evidence of lung overload in the epidemiological literature or in the color pigments industry's experience. CPMA and its members are not aware of any evidence of dust exposure to primary pigment particles in workers resulting in lung overload in the pigment manufacturing industry or downstream industries after over 50 years of production. Therefore, it is not plausible to hypothesize that continued use of a chemical substance that has been in commerce for a half-century will suddenly give rise to a previously unrecognized category of illness, and it would be extraordinarily unreasonable to speculate that color pigments could, at some future time, present an "emerging" risk like lung overload.	respirable poorly soluble particulate matter is associated with other adverse effects in humans, such as fibrosis, asthma, Chronic Obstructive Pulmonary Disease, etc., and that rodents are a good model for these effects in humans. In the chronic carbon black study by Nikula et al., (1995), fibrosis and tumors were observed in rats. Rats have a 10X faster clearance rate for particles than humans, thus EPA has interpreted that humans are also susceptible to adverse effects for particulate matter (OPPT EPA, 2010). Furthermore, as no employee health data have been provided, it is not possible for EPA to verify the validity of the claims about employee health. The Elder (2005) carbon black sub-chronic inhalation study female rat NOAEC HEC is 0.28 mg/m^3 or 8 times lower than the Nikula et al., carbon black chronic inhalation study (1995) female rat LOAEC HEC of 2.23 mg/m^3 based on lung hyperplasia, fibrosis and tumors in this 24-month study (a major duration of the lifetime of a rat). If overload is demonstrated to occur, especially when considering rat tumors, then these effects may be less relevant for human risk assessment. However, as noted, several other "noncancer" events such as inflammation and hyperplasia are related to other adverse outcome pathways and should be evaluated as relevant to humans (U.S. EPA, 2019). Overall, tumor formation from PV29 is not expected at the rat NOAEC HEC value of 0.28 mg/m^3, a concentration that does not cause inflammation and hyperplasia precursor events in animal models.
113	Page 70 of the revised draft risk evaluation states "MOE calculations and equations are provided in Appendix G and Appendix H." Appendix G has MOEs listed in a column of the first table for both central tendency and high-end	EPA has added the risk equations to the text in the final risk evaluation as well as the resulting MOEs to clarify the calculations of non-carcinogenic risk for both central tendency and high-end inhalation exposures of PV29.

#	Summary of Public Comment	EPA/OPPT Response
	exposure scenarios, but no calculations or equations. Appendix H has nothing to do with human health (but also contains neither MOE calculations nor equations).	Please see Table 4-3 in Section 4.2.1 of the final risk evaluation for the updated table of MOE calculations Appendix G has been removed from the final risk evaluation.
Occupational Exposures to Downstream Users of PV29		
105	Industrial and commercial uses of PV29 do not expose workers to greater risks than manufacturing or processing. Workers in Downstream Industries Cannot Be Exposed to Free PV29 Particles. Cutting, grinding, and similar physical processing of molded plastic parts or fibers could conceivably cause a release of *plastic* particles, but it does not release pigment particles, nor does application of paint or ink containing PV29. Even spray applications of paint containing PV29 cause the release of *paint* particles, in which PV29 crystals are bound up with binders, liquids and additives. As a result, these workers have essentially no potential exposures to PV29 particles. Workers in Downstream Industries Wear Dust Masks When Warranted. The revised draft risk evaluation agrees that workers in manufacturing, importing and processing workplaces will wear APF 10 respiratory protection. However, it assumes that workers in industrial and commercial uses (other than automotive coatings) will not. This assumption is unfounded. APF 10 respirators are half-masks; essentially, the dust masks that, until March of this year, anyone could buy at Home Depot… Finally, the Sun Chemicals safety data sheet	EPA agrees that the potential exposures to respirable PV29 particles after it has been incorporated into a plastic or rubber matrix are expected to be low. As a result, the unreasonable risk concerns identified for the manufacture and processing of PV29 only apply to scenarios where workers are handling PV29 as a solid (powder). This scenario includes processing steps where powdered pigment is mixed into paint products or incorporated into the plastic and rubber products. The unreasonable risk determinations are not meant to indicate that finished plastic, rubber or paint applied products are expected to result in an unreasonable risk concern for industrial and commercial users. This point is clarified in the final risk evaluation. In the final risk evaluation, EPA changed its determinations to no unreasonable risk for industrial/commercial use in plastic & rubber products. During the spray application, workers may be exposed to respirable PV29 however, the size of the spray particle and the fraction of PV29 bound up with other chemicals is not clear. In addition, this condition of use encompasses the potential for applicators to be exposed to PV29 as a result of sanding cars painted with paint containing PV29 pigments. There is unreasonable risk determined for industrial and commercial users in the paint and coatings sector.

#	Summary of Public Comment	EPA/OPPT Response
	for PV29 recommends use of respiratory protection where warranted.	The Agency stands by the assumption that most industrial and commercial users (except application of paints) of PV29 containing material are not expected to use PPE as these uses involve the handling of finished products where release of PV29 is not expected. This is clarified in the assessment, where risks to commercial/industrial uses are not expected to result, except in the case of auto paint use.
120	EPA has no valid basis for concluding that processing exposures will not exceed manufacturing exposures. EPA estimated the highest full-shift exposure to occupational users at Sun Chemical at 0.37 mg/m^3 and reported that workers at Sun Chemical handle PV29 at nearly 100% concentration. However, sampling of repair technicians engaged in orbital sanding of automobile paint (see citation) has found total dust concentrations as high as 12 mg/m^3. Under this condition of use exposures could exceed those in manufacturing if the concentration of PV29 in the paint exceeds 3.08%. Citation: Enander, R. T., Cohen, H. J., Gute, D. M., Brown, L. C., Desmaris, A. M. C., & Missaghian, R. (2004). Lead and methylene chloride exposures among automotive repair technicians. *Journal of Occupational and Environmental Hygiene*, 1(2), 119-125.	The air concentrations EPA used for the risk estimates are for the respirable particulates. The OSHA PEL for respirable fraction is 5 mg/ m^3 and it is not reasonable to assume that 12 mg/ m^3 of dust measured in the study is entirely composed of respirable particles of PV29. EPA has revised its estimations for exposures to PV29 as a result of downstream processing and use activities. As explained in Section 4.2.3 of the assessment, the updated exposure concentrations for downstream processors are the same central tendency and high-end workplace concentrations that are expected to result from manufacturing activities. EPA determined that this is a more appropriate approach given the lack of data characterizing exposures to downstream processors and users.
112	The revised draft risk evaluation states that approximately 90% of that volume is consumed as a site-limited intermediate, so it should be expected that significantly less of the PV29 produced is used for other processing applications. Therefore, the assessment of occupational exposures in the revised draft risk evaluation does not reflect reasonably foreseen conditions of use in context of the information that EPA has, including use patterns and consideration of the stable annual production volumes.	The final risk evaluation considers all known, intended and reasonably foreseen conditions of use. The volume expected in the processing of PV29 is the remaining 10% manufactured, not that which is used as a site-limited intermediate.

#	Summary of Public Comment	EPA/OPPT Response
108	The assumptions made by EPA as to similarity in exposures between manufacture workers and other downstream activities skew the exposure assessment towards overestimation. The same is true for the assumption that no PPE is used during industrial and commercial use of plastic and rubber products and in automobile plastics. AAI member facilities comply with OSHA standards: grinding or milling of rubber or plastic articles impregnated with small amounts of PV29 does not release pigment particles. AAI conducted a survey of its members that indicated preliminarily that in paints and coatings used in the automotive industry, any addition of PV29 would take place at the supplier level. This survey also would indicate that spray painting of coatings is primarily applied in controlled, robotic environments. Workers use respirators, chemical gloves, and overalls. AAI automotive facilities strive to ensure that workers have PPE designated to address the most rigorous OSHA standards that would apply.	EPA has updated its descriptions of conditions of use to indicate that exposures are expected to be negligible from the handling of finished plastic and rubber products as a result of industrial/commercial uses where PV29 is not handled directly or applied as a paint. As a result, there are no risk concerns identified for industrial/commercial uses except for application/use of auto paint. EPA appreciates the information regarding PPE use at AAI member facilities. However, considering that not all facilities are AAI members the Agency accounts for possible exposures in non-member facilities. EPA stands by its assumption that not all industrial and commercial users use PPE in order to derive a risk determination because there is no PV29 OSHA requirement. There is the exception for automobile OEM & refinishing for which EPA assumes use of respirators with APF of 25. Although the assumptions may skew towards overestimating risk, the conservative high-end exposure approach is appropriate for the reasonably available data.
119	EPA solicited information about exposures of PV29 to downstream processors, but data were insufficient and indicate that downstream processers handle PV29. No information about use of PPE by downstream processers and users was provided to EPA.	EPA appreciates the information provided to the Agency that describes the downstream processor activities and resulting exposures. The Agency did receive limited information from Sun Chemical Corporation about their processors' use of PPE. This information is available in the supplemental file, titled, "*Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a). The Agency is using this information in a limited fashion for risk characterization purposes and acknowledges uncertainties regarding the assumption that

#	Summary of Public Comment	EPA/OPPT Response
		the use of PPE are applicable across all downstream processors.
119	EPA erroneously assumed that dust concentrations in downstream processing industries are never higher than those from manufacturing at Sun Chemical.	EPA appreciates that potential for exposure to total dust may be higher in processing facilities than in the manufacturing facility, but EPA does not agree that downstream processing activities are likely to result in exposure to PV29 at levels higher than in the manufacturing facility. EPA has made a number of conservative assumptions when describing the high end exposure estimate for manufacturing exposure that leads the EPA to conclude that 1.2 mg/m^3 represents the true high end exposure across all conditions of use. First, EPA has assumed that the highest exposure concentration to total workplace dust, as presented in Table 2-4 is comprised of 100% PV29. Second, EPA is assuming that employees will be exposed to this high-end concentration for the entire shift. In addition, during these activities, workers are handling material that is comprised of 100% PV29, which is assumed to be the activity which results in the highest potential for exposure, as it is not encapsulated in plastic or other matrices. As a result of these assumptions, EPA is confident that the high-end exposure concentration used to describe exposure through downstream processing activities is sufficiently protective to describe the exposure through these activities.
109	ACA is concerned that data related to particle size is not incorporated into the risk evaluation in a manner that reflects realistic practices during paint formulation and downstream use of paint, and is concerned that unwarranted assumptions have led to findings of unreasonable risk for two conditions	As explained in the final risk evaluation, reasonably available data indicates PV29 can be formulated into a powder of varying particle sizes. The conflicting information provided by the manufacturing stakeholders regarding the particle size data for PV29 and the lack of adequate explanation or characterization of particle size

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	of use: (1) Processing into formulation – Incorporation into formulation, mixture or reaction products in paints and coatings; and (2) Industrial and Commercial Use, paints and coatings, coatings and basecoats. Even without PPE, it is ACA's understanding, from PV-29 manufacturers that exposure is physically impossible since PV-29 particles at the nanoscale would agglomerate. PV-29 manufacturers further state that industrial and paint applicators would not handle PV-29 in the powder from, but instead in a pellet, bound in a matrix, as noted in comments filed by CPMA. ACA also asserted that engineering controls and PPE use further reduces exposures, including use of closed and automated systems by most manufacturers of automotive paint, and common PPE and engineering controls implemented by paint formulators, including ventilation and respirators of higher protection factor than the assumed PF 10 respirators.	distribution information of actual workplace dust led EPA to consider the distribution of all available particle size data and its relevance to PV29 dust found in the workplace. Further conflicting information is provided in this comment by CPMA. Earlier in their comment, they indicate that pigments are only "deagglomerated" into the primary (smallest) particles following dispersion in inks, plastics or paints, yet later in the comments, they are indicating that paint applicators who are presumably handling these stable dispersions are only exposed to agglomerates or plastic pellets. The conflicting and unsubstantiated information provided by Sun Chemical only serves to bolster the need for particle size measurements taken from actual workplace dust in order to clarify the potential for exposure. In the absence of such empirical evidence, EPA assumes that potential exposure to PV29 of all particle size diameters described in the reasonably available data is possible. Regardless, EPA has updated the approach regarding the use of particle size information. Due to the deficiencies in the particle size data, EPA is no longer using particle size information to estimate the % deposition of the particles in the lung, but now only using this information to judge the adequacy of the carbon black analogue. Please refer to Section 3.2.3.1 of the final risk evaluation for a discussion of the comparative particle diameters of carbon black and PV29. EPA has updated its assumptions about PPE usage for automotive paint applicators. In the final risk evaluation, an APF of 25 is assumed to account for the practices described in this comment received from CPMA.
Assumptions About OSHA Requirements Regarding Workplace Exposure Controls and Safety Data Sheets (SDSs), and Personal		

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Protective Equipment (PPE)		
120	The use of an assigned protection factor (APF) of 10 is supported only by a report from Sun Chemical that workers wear "dust masks" during manufacturing activities. EPA does not report whether the wearing of "dust masks" is voluntary or mandatory. Nor does EPA report how it determined that it was appropriate to assign a protection factor of 10 to these "dust masks." Dust masks do not appear to be filtering facepiece respirators and should not receive an APF of 10.	EPA believes that information provided from the only domestic manufacturer about the dust masks used in its manufacturing facility supports the Agency's assumption for PPE use. The air-purifying respirators with an APF of 10 were assumed (Refer to Table 2-7 in the final risk evaluation).
120	Access to respirator PPE is likely reduced as a result of the COVID-19 pandemic. In a pandemic, during which there are not enough such respirators for health care, the assumption that they would be available in manufacturing is utter nonsense.	In the risk evaluation EPA maintains its assumption that PPE is being used during manufacturing and processing of PV29. The PPE assumptions from the Agency are not limited to PPE use during this pandemic, but practices before and after as well.
119	EPA continues to apply the unwarranted assumptions that many workers engaged in manufacturing, processing, using and disposing of PV29 will wear personal protective equipment (PPE) and that such equipment is fully effective in protecting them from exposure to the chemical. Elsewhere in these comments and in EDF's prior comments on the initial draft risk evaluation, we have rebutted these assumptions in great detail. EPA should base its occupational risk estimates and risk determinations on the exposures absent use of PPE that workers face. For the majority of the conditions of use EPA examined, it assumed workers would wear PPE providing an APF of 10 (and in one case, for auto paints, an APF of 25). Information provided by the manufacturers regarding use of PPE failed to identify any specific activities as requested by EPA, and no information on quantified effectiveness other	EPA believes that information provided by the only domestic manufacturer about the use of PPE (*i.e.* half face dust masks) in its manufacturing facility supports the Agency's assumption of PPE use. In addition, for processing, recycling, and disposal conditions of use, air-purifying respirators with an APF of 10 were assumed. For one condition of use, paints and coatings for automobile (e.g., Original Equipment Manufacturer (OEM) and refinishing), EPA assumed the use of a supplied-air respirator (continuous flow mode) with an APF of 25. For the remaining industrial, commercial, and consumer conditions of use, EPA assumed no use of a respirator because there is no PV29-specific OSHA requirement and no reasonably available data to support a use of PPE under these uses. The PPE assumptions for all the conditions of use did not affect the unreasonable risk determinations made. Only an

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	than a general specification for the type of paper mask used, which does not reflect performance in actual use. The response's use of the subjunctive case ("would be") casts doubt on the reliability of the information being provided. The "detailed work instructions" referred to were not provided (or if they were, EPA has not made them publicly available).	assumption of PPE with APF of 50 would eliminate unreasonable risk; however, the final risk evaluation does not use that assumption for any condition of use.
113	EPA has not justified the assumption that respirators will be used either in PV29 manufacture or in downstream conditions of use. OSHA regulations do not require respirators for PV29-exposed workers, and EPA has repeatedly acknowledged that respirator use in many workplaces is sporadic and often ineffective. EPA should assume no PPE (in this case, respirators) in calculating MOEs for PV29.	Please refer to comment directly above for discussion of PPE assumptions and justifications.
119	Many major limitations of the PV29 SDSs as a means of worker protection, which is discussed in more detail in subsection C. of the comment. EPA's reliance on them as a basis for assuming proper and effective use of PPE is even more far-fetched. BASF SDS (see PV29 Supplemental file) has no information regarding precautions or use of PPE. Sun Chemical SDSs (see PV29 Supplemental file) state in section 8 that there are no applicable occupational exposure limits, while EPA claims and relies on OSHA's respirable dust PEL as one of the bases for claiming workers would be required to wear PPE. The SDSs make no mention of this PEL and hence the user of the SDS would have no idea of the existence of the standard on which EPA relies.	EPA believes that information provided by the only domestic manufacturer about the dust mask used in its manufacturing facility supports the Agency's assumption of PPE use. The Agency only assumes PPE use by manufacturers and processors with an APF of 10. No PPE is assumed for industrial and commercial users, except auto paint refinishers. Even with the PPE assumptions for manufacturers and processors, unreasonable risk is determined. Reducing the PPE to none would not change the risk determinations for manufacturers or processors and would be inconsistent with reasonably available information regarding PPE usage at manufacturing and processing facilities. Refer to response directly below for discussion about the OSHA standards for PV29.

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	TCI America SDS does not indicate adequate instructions for use of PPE. Given this lack of evidence as well as the lack of any binding requirement on employers to ensure workers are protected through use of PPE, EPA should assume workers do not wear PPE in making its risk determinations.	
119	To justify assumptions about PPE use, EPA grossly distorts and mischaracterizes OSHA requirements, including with respect to PPE use. First, EPA acknowledges – and then dismisses – the fact that the agency does not have "reasonably available information" on use of PPE for each condition of use. Contrary to EPA's assertion that, "in the absence of such information," it can simply assume compliance – especially where there is no clear and universally applicable requirement regarding PPE use for this chemical – EPA should instead assume no use of PPE. Second, EPA implies that OSHA worker protection standards are in place for PV29, while in fact there is no OSHA PEL for PV29. EPA goes onto invoke three OSHA regulations relating to employers' obligation to provide respiratory protection from exposure. Its hazard communication standard, 29 C.F.R. § 1910.1200, its respiratory protection standard, 29 CFR § 1910.134, and its standard and PEL for respirable dust, 29 CFR § 1910.1000. None of these consistently requires employers to provide respiratory protection from PV29. Significant evidence demonstrates that SDSs are often of insufficient quality to be useful and are frequently not understood. Assuming use of PPE conflates risk evaluation and risk management and significantly understates risk.	EPA disagrees that the OSHA standards for worker protection are not applicable to PV29 particulate exposures in the manufacturing and processing workplace. Although there is no chemical specific OSHA PEL for PV29, the OSHA PEL for general and respirable nuisance dust applies to all solids including PV29. EPA generally assumes compliance with OSHA requirements for protection of workers, including the implementation of the hierarchy of controls. In support of this assumption, EPA used reasonably available information indicating that some employers, particularly in the industrial setting, are providing appropriate engineering, or administrative controls, or PPE to their employees consistent with OSHA requirements. EPA does not have reasonably available information to either support or contradict this assumption for each condition of use; however, EPA does not believe that the Agency must presume, in the absence of such information, a lack of compliance with existing regulatory programs and practices. Rather, EPA assumes there is compliance with worker protection standards unless case-specific facts indicate otherwise, and therefore existing OSHA regulations for worker protection and hazard communication will result in use of appropriate PPE in a manner that achieves the stated APF or PF. EPA's decisions for unreasonable risk to workers are based on

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		high-end exposure estimates, in order to account for the uncertainties related to whether or not workers are using PPE. EPA believes this is a reasonable and appropriate approach that accounts for reasonably available information and professional judgement related to worker protection practices, and addresses uncertainties regarding availability and use of PPE. The PPE assumptions for all the conditions of use did not affect the unreasonable risk determinations made. Only with an assumption of PPE with APF of 50 would be protective to eliminate unreasonable risk; however, the final risk evaluation does not use that assumption for any condition of use; therefore, no PPE assumptions conflated the risk evaluation or understated the risk of PV29.
111	EPA continues to make assumptions about PPE which are scientifically unsupported.	EPA believes that information directly from the only domestic manufacturer about the dust mask used in its manufacturing facility supports the Agency assumption for PPE use. EPA further stands by the assumption that industrial and commercial users (except auto refinishers) do not use PPE.
EPA Makes Broad, Sweeping Conclusions on Risks Faced by Occupational Nonusers (ONU)		
119	EPA also relied on several unsubstantiated assumptions. First, the agency assumed that all ONUs would be subject to lower exposures than occupational users – even those ONUs engaged in potentially high-exposure activities such as maintenance, repair and cleaning. Second, in the absence of any data on downstream processing, the agency assumed that dust concentrations in downstream processing industries are never higher than those from manufacturing at Sun Chemical.	EPA has updated the assumptions in the final risk evaluation regarding downstream exposure. EPA is now assuming that downstream users and processors that handle PV29 are exposed equally to workers at the manufacturing facility. EPA assumes that workers at the manufacturing facility are handling PV29 directly. Based on anticipated uses of PV29, EPA believes that it is reasonable to assume that this represents the highest-end potential for exposure, as this is

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		the only activity where workers will encounter scenarios where 100% of respirable dust is comprised of PV29. For downstream users and processors, the highest expected exposure scenario involves processes where workers are handling PV29 in a powder form. As such, it is reasonable to assume that inhalation exposure from these activities is not higher than scenarios where manufacturing workers will be handling PV29 dust.
Using Submitted Data Characterizing PV29 Concentration in the Breathing Zone, EPA Miscalculated Airborne Exposure Concentrations in its Calculation of Exposure		
105	Sun complied with the test order. EPA cannot assume that exposure assessments for batch operations can and will operate sampling equipment for longer periods of time than the batch requires. The exposure assessment was performed in accordance with the order given by the EPA and the sampling strategy that EPA agreed to and approved. The final risk evaluation should incorporate all of the test results, not just the results of the solubility testing. In particular, EPA represented the high-end of worker exposure by using 1.2 mg/m3, derived from data supplied by Sun in 2019, rather than data from the test order sampling. The method EPA's test order required has maximum sample volume of 400 liters of air, and sampling air flow rate specific for the sampling device. NIOSH 0600 measures the mass concentrations of all non-volatile respirable dust in the air, and it cannot differentiate between PV29 and dusts generated from other processes or tasks performed in the workplace. If these parameters were unacceptable for the	EPA appreciates the submission of the test data in response to the Section 4 Test Order. While the air monitoring test was conducted by following the NIOSH 0600 test guideline, there were several deficiencies noted by EPA with the submitted test data. These deficiencies, as outlined in the risk evaluation, affected the ability to accurately characterize the inhalation exposure for a full manufacturing shift producing PV29. For example, fine particulate matter can remain suspended in the air long after a process has ceased, drift to other areas of the facility, and be carried by the ventilation system. Thus, the inhalation exposure duration to workers or bystanders can be far longer than the actual process duration which generated the dust. In addition, this assumption that exposure is negligible when PV29 is not being produced ignores the possibility that ambient dust can be inhalable when it is disturbed during cleaning. This factor must be considered in the exposures to workers and in the risk assessment. As explained in the assessment, as a result of the short duration of the sampling, EPA must make assumptions to ensure that the exposure concentrations do not underestimate exposure to workers in a manufacturing facility.

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	purposes of EPA's risk assessment, then a different method should have been specified in the order. Indeed, the sampling plan was amended to specify use of the PPI device, to lower the flow rate from 2.5 lpm to 2.0 lpm, to require discard of samples where the pre- or post-flow rate variance exceeded 10% of the average, and to raise the maximum sample run time from 160 to 200 minutes. It would be particularly unfair and unreasonable for EPA now to fault the work for following specifications that were added at EPA's direction.	The NIOSH protocol which is a key part of the test order includes discretion. The discretion ensures that the protocol can accommodate different workplace settings/conditions and that the study result is informative. The expressed purpose of the test order was to reduce uncertainties in assessing PV29 occupational inhalation exposures. However, as noted above, and as outlined in Appendix I of the final risk evaluation, the study deficiencies precluded the ability of EPA to accurately characterize workplace inhalation exposures. As a result, EPA had to make several assumptions for the final risk evaluation. The approved study plan included a total of 43 samples, 30 worker Occupational User (OU) samples and 13 Occupational Non-User (ONU) samples. Instead, 23 OU samples and six ONU samples were collected. Concerns are described further below. In addition, the samples were collected in a sub-optimal manner such that results are not representative of OU exposures and ONU exposures: - Based on IH study, workers were in the PV29 area over multiple samples. Samples were collected for short periods of time back to back instead of collecting each sample for a longer period of time to better represent the full duration of the PV29 tasks performed. The short-sampled durations contributed to nearly every sample result being below the limit of detection. - EPA approved the Sun-requested modification to use a Parallel Particle Impactor (PPI), although the flow rate was not specified. The lowest flow rate PPI was used for the sampling, which resulted in most samples being below the limit of detection.

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		Based on the low measured concentrations; a higher flow PPI would have allowed a higher volume of sample resulting in a better characterization of the worker and ONU exposures. - Area samples were collected right next to open bay doors, which may not have been representative of exposures to ONUs. Sun stated that they monitored in that area with bay doors open because that was the best representation of ONU exposures. - Lastly, there were three instances of pump failures which resulted in samples being lost. A good industrial hygiene (IH) survey requires sampling practices that consistently provide information supporting the purpose of the project. It is important that the limit of quantitation (LOQ) (*i.e.*, the actual airborne respirable dust concentration that can be reliably quantified by the laboratory) and limit of detection (LOD) be lower than the level of interest, which should be defined during the planning phase of the project. There are several accepted industrial hygiene procedures that, when followed, can limit the number of sample results that are below the LOQ or the LOD. As a starting point, the sampling team should understand the purpose and priorities of the project. Shorter task-based samples can be used to better understand exposure sources and plan more targeted sampling strategies, while full-shift samples best characterize employees' daily workplace exposure. Airborne contaminant levels should be estimated and used to calculate the sample air volume needed to achieve the desired detection level. If the contaminant concentration cannot be estimated in advance, preliminary screening samples may be collected and analyzed to determine the contaminant concentration range and permit sampling

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		teams to make informed choices when designing the survey. An additional consideration for sampling teams planning to obtain quantifiable or detectable respirable dust sample results is that total dust concentrations tend to be substantially higher than the respirable dust fraction, since total dust includes more large particles and more mass, so airborne concentrations (in mg/m^3) are almost always appreciably higher for total dust than respirable dust. Sampling teams should use great caution if attempting to use total dust sample results as information to design a respirable dust survey. In all cases, sampling a larger air volume improves the likelihood of obtaining sample results above the LOQ or LOD. Higher air sampling volumes can be achieved by choosing higher sampling pump airflow rates (if permitted by the sampling equipment and method) or by increasing the length of the sampling time (to the extent practical for the project goals). Therefore, the quality and accuracy of information obtained from an industrial hygiene sampling survey is improved when the sampling team collects concurrent personal samples of different lengths (task-based and half-day, in addition to full-shift) and high-flow area samples. The most meaningful workplace exposure sample results are obtained from full shift personal breathing zone sampling methods; however, if contaminant levels are truly miniscule and unable to be detected by personal sampling methods, supplemental high-flow area sampling is likely the best way to confirm that airborne contaminant concentrations are well below the level of interest.
105	EPA cannot assume that PV29 workers will be exposed for 10.5 hours/day at concentrations of 1.2 mg/m^3. EPA assumed that the unsampled portion of the work shift had the same average exposure to PV29 as the sampled portion.	The OSHA Technical Manual (2014) describes the importance of full-shift sampling when determining compliance with a full-shift TWA PEL. The Sun IH study failed to include any full-shift air measurements, resulting

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	Assuming that exposure for the unsampled portion of the work shift was the same as the sampled portion overestimates potential exposure. This approach is incorrect and inconsistent with standard industrial hygiene practice for this type of batch process operation. The reality of batch manufacture of PV29, as noted by the revised draft, is that "employees at Sun Chemical only spent a fraction of their shift (approximately ½ hour to 2 hours) actually handling C.I Pigment Violet 29." It is not a "deficiency" of the study that they did not have longer exposures, it is an unavoidable artifact of batch manufacture. EPA's risk evaluation processes need to accommodate this commercial reality, not force it onto a Procrustean bed that assumes continuous manufacture. These assumptions are individually implausible, and collectively they exceed the realm of the possible.	in most measurements being below the LOD. As a result, EPA had to make several assumptions including the duration of exposure explained in Section 2.3.1.2 of the final risk evaluation. To estimate high-end exposure to occupational users (OUs), EPA assumed that workers in the manufacturing facility were exposed at the maximum dust concentration as presented in Table 2-4. To estimate central tendency inhalation exposure for OUs, EPA used the results of the dust monitoring study to calculate an average monitored concentration. This involved creating an average of the LOQ/2 for each shift operator. Of these values, the central tendency was determined to be the highest average of these monitored concentrations. Similarly, for the occupational non-users (ONUs), EPA estimated central-tendency exposure by taking an average of the LOQs/2 for all operators determined to be ONUs in the dust monitoring report, while high-end for ONUs was estimated using the maximum detected concentration reported in the dust monitoring study. To calculate an MOE for both OUs and ONUs, these concentrations are converted to an average daily concentration according to the approach outlined in Table 4-3. Due to the short duration of the sampling, there is insufficient information for EPA to conclude that inhalation exposures to OUs and ONUs are negligible when they are not performing activities where they are handling PV29 directly. This ignores the potential for dust in the workplace to be re-entrained through cleaning and incidental contact. This also potentially overestimates the effectiveness of ventilation present in the facilities, for which no information was provided. As a result of the lack of data, EPA assumes that there is the potential for exposure between PV29 production activities.

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106	EPA's assumptions for sentinel exposure are individually implausible and collectively exceed the realm of the possible. It is assumed that 100% of dust in the workplace at the highest level ever recorded (1.2 mg/m^3) would be PV29 and that workers would be exposed throughout their shifts. Other materials besides PV29 are handled at Brushy Park, and so dust particles will never be 100% PV29. The vast majority of PV29 production at Brushy Park is also transferred mechanically directly into equipment for producing other pigments and is not sold to customers without potential for worker exposure.	As indicated above, the respirable dust monitoring study provided by Sun Chemical lacked full-shift monitoring to allow EPA to adequately understand workplace exposure to dust. As the Sun IH study failed to include any full-shift air measurements and most measurements are below the limit of detection, EPA made conservative assumptions using reasonably available data in order to understand the potential exposures to PV29 during manufacturing activities. See Section 2.3.1 for an explanation of the occupational exposure methodology and Section 4.2.2 for a summary of the methodology used in the risk calculation.
113	We believe the test order data can be used, in the near term, for exposure estimates but also agree with EPA that the data have substantial limitations, leading to a number of uncertainties (see pages 53-54 of the revised draft). The Sun Chemical studies provide support for risk determinations in the absence of better information, but over the long term, they should be replaced with new data collected in a manner consistent with the test order study plan and fully compliant with the NIOSH 0600 test guideline.	The EPA appreciates the commenter's suggestion to replace the TSCA Section 4 Test Order data, but the time required to repeat the testing is not feasible in order to complete the final risk evaluation. The Agency also believes that the risk evaluation can be completed even with the deficiencies in the test data.
113	Over the longer term, EPA should get better data by having Sun Chemical conduct another study that is in compliance with the test order study plan and NIOSH test guideline, resolving the Limitations and Uncertainties described on pages 53-54 of the revised draft.	Refer to comment above. The Agency also believes that the risk evaluation can be completed even with the deficiencies in the test data.
112	EPA used personal breathing zone (PBZ) monitoring data to estimate the average air concentration of PV29 for the purposes of calculating the LADC. Data from two studies were summarized in Table 2-5 and Table 2-6. The first study used the NIOSH 0500 method for total (inhalable) dust, which typically uses a 5-μm filter (Table 2-5). Inexplicably, EPA only used the value from the higher sample (14-0941902) to establish the value for the high end exposure calculations. It	The highest measurement is not a full shift measurement. EPA made a decision to use this highest measurement as the high-end exposure level and was used for the risk calculation. As this was the highest value actually reported in the manufacturing facility, EPA determined that this, rather than using a regulatory limit such as the OSHA PEL of 5.0 mg/m3 for respiratory dust, is a more appropriate value to represent high-end exposure. As explained in

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	is not clear why there are two values for one worker in one shift. If these samples are sequential samples for the same worker during the same shift, the combined weighted average of 0.72 mg/m^3 should be used to represent exposure across the entire shift.	Section 2.3.1 and Section 4.2.2, in order to better understand the potential occupational exposures, EPA calculated central tendency exposures using the data provided in the dust monitoring study. The risks from this central tendency exposure is presented in the risk calculation for additional context.
112	The second study used the NIOSH 0600 method for respirable dust, which would capture PV29 dust across the particle size range it realistically would occur. Of the 22 samples collected, 20 were below the limit of quantitation (LOQ) for respirable dust. EPA estimated that the dust concentration in air associated with below-LOQ samples was half the limit of quantitation of the method, or LOQ/2. There is a robust body of literature representing the best available science for applying modern statistical approaches to handle exposure data, including monitoring data with values below the limits of detection (LOD), *i.e.*, left-censored data. EPA should apply the methods for analyzing the left-censored occupational air monitoring data that are a common component of the risk evaluations they are developing (e.g., maximum likelihood estimation), as these are the current state-of-the-science methods.	As indicated above, the Sun Chemical IH study did not include any full-shift air measurements and most of measurements are below the limit of detection. EPA followed EPA guidelines for analysis to process non-detects. EPA has determined that given the deficiencies in the dust monitoring study, EPA has made reasonable assumptions to calculate central tendency and high-end inhalation exposure to PV29. Given the small sample size presented for each operator, many statistical tools proposed to analyze left-censored data may not be appropriate.
112	EPA's calculation of an LADC, which is typically used for cancer risk, is inconsistent with the revised draft risk evaluation where EPA determined that C.I. Pigment Violet 29 is not likely to be carcinogenic (p. 80). For chronic non-cancer effects, EPA should calculate an average daily concentration (ADC). This would be consistent with EPA's approach in other risk evaluations.	EPA agrees and has calculated an ADC instead of an LADC to estimate exposure in the final risk evaluation.
112	As shown in Appendix G of the revised draft risk evaluation, EPA used the same ED and EF parameters for both central tendency and high end exposure estimates; that is, ED of 10.5 hr/day and EF of 190 hr/yr. Specifically,	For the manufacturing workers, EPA assumed 190 days year exposure based on the following:

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	currently available data collected by EPA indicate that the exposure duration and exposure frequency are substantially lower for both the manufacturing and processing conditions of use. For manufacturing, the data from the Sun 2020 IH Survey (EI Group 2020 HERO: 6656714) show that workers perform multiple tasks during their shifts and the duration of PV29 tasks range from 1 hour to 5 hours per day. Therefore, the agency should use a central tendency exposure duration between 1 to 5 hours per day, and a high end exposure duration of 5 hours per day for the manufacturing condition of use. For processing, Sun indicated that approximately 350 lbs of PV29 are processed per batch and 8,800 lbs are processed per year at these processing facilities for paint plastics (e.g., nylon fibers for carpets). Sun indicated, "[w]orkers are only exposed during the short weigh up and transfer process of a couple minutes. Extruder time depends on batch size and equipment size, but can take up to 30 minutes for the entire process" (EPA 2020b, p. 44). Therefore, 30 minutes should be representative of central tendency exposure duration, and a multiple of 30 minutes, perhaps 2X or 3X, would then be a reasonable high end exposure duration. Information from Sun indicates PV29 is manufactured in batches ranging from roughly 1,000 lbs to 7,000 lbs; the average batch size for four batches reported is 4,048 lbs. Data from the Sun IH Survey (EI Group 2020, p. 26) suggest that multiple smaller batches may be manufactured in a single day/shift. Therefore, a reasonable central tendency annual manufacturing frequency should be approximately 125 batches/yr (500,000 lbs/4,000 lbs per	The batch sizes during the industrial hygiene survey ranged from 2,000 lb to 7,000 lb. Based on IUR submission from Sun, the production volume is 600,000 lbs/year: 600,000 lb/year / (2,000 ~ 7,000 lbs/batch) = 86 ~ 300 batches/year. Assuming 1 day/batch, this would be 86 to 300 days/year for the manufacture of PV29. In addition, the company stated that PV29 is manufactured and/or used "362 days/year" (This information is available in the supplemental file, titled, "*Supplemental File: Information Received from Manufacturing Stakeholders* (U.S. EPA, 2020a)). Based on this information provided by the manufacturer, EPA assumed the following for a typical manufacturing worker: 2,000 work hours per year and 10.5 hours per day (2000/10.5 = 190 days/year)for the duration of exposure, the company did not provide any information which showed that the workers are not exposed during the non-sampled period. EPA assumed workers are exposed at the same level as ONU during the non-sampled period. Due to the low and inconsistent quality of the data received, EPA made conservative assumptions to assure that all potential exposure scenarios are accounted for and to ensure that the high-end scenario actually represents potential high-end scenarios for manufacturing and downstream exposures. EPA appreciates that this approach may lead to some overestimation of potential exposure for some exposure scenarios and has provided both high-end and central tendency estimates of exposure in the risk characterization to account for this.

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	batch); given that there are two shifts per day, any individual employee is not likely to work on every batch throughout a given year. Of the five operators on Shift A at the Sun facility who worked on the three days for which respirable dust monitoring data was collected, only one (Operator #1) worked on PV29 production on more than one day. For Shift B, two operators are identified who each work on only one shift. Consequently, a reasonable central tendency annual exposure frequency would be 60-65 days per year (125 batches/2 shifts). A reasonable high end annual manufacturing frequency would be 80-85 days per year (500,000 lbs/3,000 lbs per batch per day divided by 2 shifts per day). For processing, Sun Chemicals indicated that processing of PV29 into plastics and paint only 6 to 12 days/yr typically. Therefore, the logical central tendency and high-end exposure frequency would be 6 days and 12 days, respectively. Based on the data provided by Sun regarding worker shift activity patterns and batch production sizes, it appears the maximum hours of total annual production is approximately 350 to 400 hours per year. The total ED-EF should not exceed this value on the high end.	
113	After the SACC raised numerous concerns about the initial draft, EPA issued a narrow test order under TSCA section 4 requiring only solubility studies in water and octanol and dust monitoring at the Sun Chemical workplace (the sole U.S. manufacturing site). The agency did not, however, require a 90-day subchronic study and other health effects studies recommended by commenters, including EPN.	EPA appreciates the commenter's request for a 90-day subchronic study on PV29 in the TSCA Section 4 Test Order; however, the test was not requested by the Agency because the Agency believes that the risk evaluation could still be completed without the information.
112	EPA did not provide any explanation for the averaging time calculation used in the revised draft risk evaluation that appears to deviate from normal practice. The value used in	EPA agrees with this comment and has updated the approach to calculate an ADC to represent potential exposure to workers.

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	the revised draft is classified as an AT_LADC and the value used is 155,610 hours, described as being derived from 78 years x 10.5 hours/day x 190 days/year. As stated above at the beginning of Section III, ADC and LADC are used to estimate air concentrations associated with chronic workplace exposures for non-cancer and cancer risks, respectively. The averaging time used for occupational exposure to a non-carcinogen should be "living hours" for the duration of a career (e.g., working years x 24 hours/day x 365 days/year), and for a carcinogen, the average lifetime of 78 years is used, consistent with the approach used in the risk evaluation for carbon tetrachloride.	
119	EPA has generally relied on its high-end estimates of occupational inhalation exposure for its risk determinations. This, too, is appropriate – indeed necessitated – by the insufficient quantity, poor quality, and high variability of the inhalation hazard and exposure information EPA has.	EPA acknowledges the comment.
119	High end exposure may not be representative of downstream exposures.	In the absence of robust information for downstream exposures, the Agency stands by its conservative approach to assess exposures.
Use of Carbon Black as an Analogue		
105	CPMA indicated that the smallest particle size of PV29 is not representative of pigment dust found in the workplace as it does not take into account the potential for the chemical to form agglomerates. Therefore, it is not appropriate to use carbon black as an analog for evaluating the toxicity of PV29. Rather, a more appropriate analog would be one involving the larger particle sizes considered in the evaluation. Examples for which data are available include Barium sulfate and Diketopyrrolopyrroles (DPP) pigment, which is closer to PV29 than inorganic carbon black in terms of chemical structure, properties and use.	As discussed in prior responses, EPA disagrees that the smallest particle size of PV29 is not representative of possible workplace exposures. Sun Chemical has not provided sufficient empirical evidence to discount the possibility that PV29 in the air may exist at the smallest particle sizes. As a result, EPA used all of the particle size distribution information provided by Sun Chemical and BASF to describe possible exposures in the workplace. The diketopyrrolopyrrole pigments DPP inhalation study by Hoffman et al. has been carefully considered by the

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		Agency (Hofmann et al., 2016). The study is only 5 days in duration for particle exposure, thus not appropriate for evaluating sub-chronic and chronic particulate matter exposure durations for PV29. Data characterizing the inhalation toxicity of Barium sulfate was considered an appropriate analogue to characterize the inhalation hazard of PV29 in the *OPPT Updated Risk Characterization for Occupational Inhalation of PV29 Based on Updated Approach* because of similar particle diameter. Based on the updated particle size information provided by Sun Chemical, $BaSO_4$ is not an appropriate chemical substance to understand the potential chronic effects of PV29 inhalation at the smallest particle size, as it is much larger and more dense (MMAD=4.3 μm vs 0.043 for PV29). In contrast, the DPP analogs proposed by CPMA contain only two conjugated rings and also contains halogens, thus carbon black with multiple conjugated aromatic rings without halogenation is a much better analogue for PV29 with similar structures. Carbon black is a suitable analogue for PV29 because both compounds are pigments and are respirable, poorly soluble particulate matter that are expected to cause increased lung burden via inhalation exposures and potentially kinetic lung overload at higher exposure concentrations Elder et al. (2005). Both compounds are expected to cause adverse effects to the respiratory tract such as irritation, inflammation, and proliferation. Carbon black also is structurally similar to PV29 in that both compounds contain conjugated polyaromatic ring structures. DPP pigments are not considered good analogues for PV29

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		because they only contain two ring structures that are not aromatic in nature and, DPP is a halogenated compound, unlike carbon black and PV29 (Hofmann et al., 2016).
112	The carbon black analog study Elder et al. (2005)also indicated that particle surface area was an "important determinant of target tissue dose and, therefore, effects." Based on effects observed at 7 mg/m3 high surface area carbon black (HSCb) in all three species, EPA selected the NOAEC of 1 mg/m3 HSCb as the point of departure for chronic non-cancer hazards. However, the revised draft risk evaluation does not contemplate whether PV29 has a surface area sufficiently similar to HSCb that would support the use of carbon black as an analog.	EPA does not have sufficient data to characterize several properties of PV29, including surface area. As a result, EPA did not use surface area as a criterion to understand carbon black's suitability as an analogue for the purposes of this risk evaluation. EPA has updated the discussion of carbon black's suitability as an analogue in the final risk evaluation. The Sun Chemical Corporation provided limited and unsubstantiated information on the properties of PV29 including particle size distributions and surface area.
119	While Carbon Black is a more appropriate analogue to represent the inhalation toxicity of PV29, EPA must provide greater detail for the selection of this particular study given the broader body of evidence available for carbon black.	EPA has updated the discussion of carbon black's suitability as an analogue in the final risk evaluation including the selection of the particular study for identification of the POD in Section 3.2.3.1 of the final risk evaluation.
113	As in the Elder et al., (2005) study, the focus should be on particle retention kinetics, but in the whole respiratory tract, with special attention given to examining the potential for pulmonary inflammation and histopathology, as well as the standard evaluation of systemic toxicity in other tissues. While there are notable differences in the respiratory systems of rodents and humans, these have received much attention with other chemical substances. The lessons learned can be applied in this case.	EPA has updated the discussion of the effects from inhalation exposure to include additional discussion about the potential for pathological effects such as pulmonary inflammation, increased BAL cell numbers, and increased polymorphonuclear leukocytes. Please refer to Section 3.2.3.1 of the final risk evaluation.
113	Some of the inhalable PV29 particles are nanoscale. Nanoscale particles have the propensity to be translocated systemically or to the brain, circumventing the blood-brain barrier (e.g., (Oberdörster et al., 2009)). Some types of	EPA agrees and has added a discussion in the final risk evaluation of potential for nanoscale exposures to PV29 with unknown consequences in the hazard characterization uncertainty analyses. The Elder (2005) study did not assess

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	nanoparticles have significant toxicity potential beyond lung inflammation and pathogenesis and could pose other risks of concern if there is sufficient exposure.	the systemic effects or the upper respiratory tract effects. Similarly, the referenced study by Oberdorster did not specifically assess the potential for blood-brain barrier transfer of PV29 (Oberdörster et al., 2009). This study does not provide direct evidence of this phenomenon in PV29 and the EPA has no reason to assume that the organometallic nanoparticle compounds with distinct update mechanisms such as those referenced in the study would demonstrate this for PV29, which is a nonmetallic particle.
113	EPA reconsidered the appropriateness of barium sulfate as a surrogate to PV29 for purposes of evaluating potential pulmonary system damage and lung overload. Instead, EPA selected carbon black, which has particle sizes closer to those of PV29, to understand the risks from inhalation of PV29 dust. EPN agrees with this decision because smaller-size particles could lead to a greater potential for toxicity, and carbon black is more similar than barium sulfate to PV29 with respect to this and other characteristics	EPA acknowledges the comment. Please see Section 3.2.3.1 of the final risk evaluation for the most updated approach regarding the use of carbon black as an analogue.
113	EPN supports the unreasonable risk determination to the health of workers for 11 of PV29's 14 COUs based on EPA's selection of Elder's (2005) toxicity study of carbon black to assess inhalation effects of PV29.	EPA acknowledges the comment. Please see Section 3.2.3.1 of the final risk evaluation for the most updated approach regarding the use of carbon black as an analogue and the unreasonable risk determinations for PV29.
110	Based on new information showing that PV29 particles are significantly smaller and more capable of lung toxicity than previously believed, EPA has selected carbon black as an appropriate surrogate for PV29 and used rodent sub-chronic studies on this substance to determine the risk of harmful lung effects to PV29-exposed workers. This is a sound and defensible approach. The suitability of carbon black as an analogue, evidence that PV29 dust contains particles of respirable size, and findings of severe lung damage in	Please see Section 3.2.3.1 of the final risk evaluation for the most updated approach regarding the use of carbon black as an analogue and the unreasonable risk determinations for PV29.

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	studies on carbon black all weigh strongly in favor of providing additional protection to workers from the disabling consequences of lung overload – a goal that can be accomplished by making an unreasonable risk determination for PV29 based on these effects and triggering risk management under section 6(a) of TSCA.	
Lung Cancer Effects of Carbon Black		
113	EPA's conclusion that PV29 is not likely to be carcinogenic is contradicted by the observed carcinogenicity of carbon black in rodent studies. If this substance is an appropriate analogue to PV29 with regard to lung toxicity, then it must also be used to evaluate other health effects. As carbon black is a carcinogen when inhaled, PV29 should be assumed to be one, too.	EPA asserts that there is insufficient information for PV29 to classify it as a carcinogen. EPA has added a discussion to the hazard characterization and uncertainty section (Section 3.2.3.2 of the final risk evaluation) concerning potential carcinogenic effects of the carbon black analogue. Tumors were not observed in the Elder et al., (2005) study of carbon black used to identify the POD. The relevance of particle overload to humans, and even to species other than laboratory rats and mice, is not clear. While it likely to be of little relevance for most "real world" ambient exposures of humans, it is of concern in interpreting some long-term experimental exposure data. It may also be of concern to humans occupationally exposed to some particle types (Mohr et al., 1994), since overload may involve all insoluble materials and affect all species if the particles are deposited at a sufficient rate (Pritchard, 1989), *i.e.*, if the deposition rate exceeds the clearance rate. In addition, the relevance to humans is also clouded by the suggestion that macrophage-mediated clearance is normally slower and perhaps less important in humans than in rats (Morrow, 1994), and that there will be significant differences in macrophage loading between the two species. The inherent toxicity of the compounds should be considered as well and there are no chronic oral or inhalation studies available for PV29. EPA calculated the

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		HEC values for both the Elder et al., (2005) sub-chronic and Nikula et al., (1995) chronic inhalation studies. In comparison, the Elder study female rat NOAEC HEC is 0.28 mg/m^3 or 8 times lower than the Nikula female rat LOAEC HEC of 2.23 mg/m^3. The Elder et al., (2005) study LOAEC HEC in female rats is a similar value of 1.95 mg/m^3. Lung cancer hazard is not anticipated at concentrations in which chronic active inflammation and cell proliferation are not present. Additional characterization has been added to the risk evaluation on this topic.
113	If, indeed, the two substances have similar characteristics as EPA concluded, PV29 and carbon black should be deemed to share not only physical-chemical and particle size and dimension characteristics, but also toxicity profile characteristics, including carcinogenicity.	While EPA considers the noncancer effects of lung overload such as inflammation and hyperplasia observed in carbon black studies to be relevant to PV29, EPA did not conclude the same for lung tumor formation. As discussed in Section 3.2.3.2 of the final risk evaluation, the NOAEC value of 1.1 mg/m^3 from Elder et al., (2005), used to calculate the HEC of 0.28 mg/m3 is below the LOAEC HEC of 2.23 mg/m^3 where tumor formation and precursor events such as lung hyperplasia, fibrosis were observed (Elder et al., 2005; Nikula et al., 1995). EPA has added a discussion to the hazard characterization and uncertainty section of the final risk evaluation (see Section 3.2.3.2) concerning potential carcinogenic effects of the carbon black analogue.
119	The available data for PV29 does not meet an acceptable level to indicate a lack of carcinogenicity. An analysis of PV29 through ToxTree provides a structural alert for PV29 given its structural similarity to PAHs. A more comprehensive genotoxicity evaluation is necessary to address this structural flag. Additionally, there are many	EPA has determined that inhalation of PV29 is not likely to produce carcinogenic effects as a result of genotoxicity or inhalation of particles. EPA calculated the HEC values for both the Elder and Nikula studies (Elder et al., 2005; Nikula et al., 1995). In comparison, the Elder et al., (2005) study female rat NOAEC HEC used in the risk calculation

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	potential mechanisms by which cancer may arise beyond genotoxicity and clastogenicity. For example, PV29 could potentially present a concern for inhalation carcinogenicity due to chronic inflammation resulting from particle deposition. It is worth highlighting that the surrogate proposed by EPA, carbon black, is classified by IARC as a potential human carcinogen. Further studies are required before EPA can conclude that PV29 lacks carcinogenicity potential.	is 0.28 mg/m^3 or 8 times lower than the Nikula (1995) female rat LOAEC HEC of 2.23 mg/m^3 where tumor formation and cancer precursor events were observed. The Elder study LOAEC HEC in female rats is a similar value of 1.95 mg/m^3. Lung cancer hazard is not anticipated at concentrations in which chronic active inflammation and cell proliferation are not present. Additional characterization has been added to the risk evaluation on this topic. Neither tumors, nor tumor precursor events were observed at the rat NOAEC in the Elder et al., (2005) with carbon black that was used to identify the POD. in Section 3.2.3.2 of the final risk evaluation discussion regarding carcinogenicity of PV29.
111	…the data on Pigment Violet 29 and this analogue [carbon black] are inadequate to conclude that Pigment Violet 29 is not a carcinogen.	Please see the previous comment as well as Section 3.2.3.2 of the final risk evaluation for additional discussion of the carcinogenicity of PV29. EPA asserts that based on available data, both genotoxic and based on tumor formation observed in studies with the carbon black analogue, PV29 lung cancer hazard is not expected. EPA has added a discussion to the hazard characterization for PV29 in Section 3.2.3.2 concerning potential carcinogenic effects of the carbon black analogue as they relate to PV29. Neither tumors, nor tumor precursor events were observed at the level of the rat NOAEC reported in the Elder et al., (2005) study with carbon black that was used to identify the POD.
110	While relying on the carbon black database to assess PV29's lung toxicity, EPA's revised draft incorrectly reaffirms its earlier conclusion that PV29 lacks carcinogenicity potential. This conclusion ignores the fact that that carbon black has produced lung tumors in animal studies and is classified as a likely carcinogen by the International Agency for Research on Cancer (IARC). The	Please see the previous comments as well as Section 3.2.3.2 of the final risk evaluation for additional discussion of the carcinogenicity of PV29. EPA asserts that based on available genotoxic and carbon black analogue data, PV29 lung cancer hazard is not expected. EPA has added a discussion to the hazard characterization for PV29 in Section 3.2.3.2 concerning potential carcinogenic effects of

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	mechanism for carbon black carcinogenicity in rodents – impaired lung clearance resulting in particle accumulation and inflammation – is the same mechanism EPA has identified for its non-cancer lung toxicity. If EPA believes that carbon black is an appropriate surrogate for PV29 for one endpoint, it should be a surrogate for other endpoints involving the same target organ and mechanism of action. While additional testing may well provide further insight into PV29's carcinogenicity, the extensive data-base on carbon black now supports a determination of elevated cancer risk from inhalation exposure to PV29. EPA should include this determination in its final evaluation and, as it has done for non-cancer lung effects, use the carbon black cancer studies to estimate cancer risk to PV29-exposed workers.	the carbon black analogue as they relate to PV29. Lung cancer hazard is not anticipated at concentrations in which chronic active inflammation and cell proliferation are not present. Neither tumors, nor tumor precursor events were observed at the rat NOAEC in the Elder et al., (2005) study with carbon black that was used to identify the POD.
Potentially Exposed or Susceptible Subpopulations		
119	EPA's reliance on Stark et al., 2013 to assert a lack of increased susceptibility for any subpopulation is entirely inappropriate. Stark et al., 2013 is a gavage study that does not examine pulmonary effects resulting from inhalation of PV29—a primary concern identified by EPA. The millions of individuals in the U.S. with respiratory conditions are undeniably a relevant susceptible subpopulation and EPA's risk evaluation of PV29 must reflect the risks to these individuals.	The OECD 421 reproductive-developmental study did not detect significant effects at the limit dose of 1000 mg/kg/day. However, oral data may not adequately address concerns via the inhalation route. EPA believes that the information provided in the Stark et al., (2013) study provides adequate evidence that additional chronic oral toxicity data are not needed, as the information provided in the reproductive and developmental screening study do not indicate that toxicity following chronic oral exposures to PV29 is not expected.
111	EPA does not have sufficient evidence to determine that Pigment Violet 29 does not have reproductive/ developmental toxicity due to the methodological inadequacy of BASF's test protocol, the unjustified dismissal of potentially impactful findings in its study, and the lack of power of the OECD 421 screening method to determine lack of toxicity.	The OECD 421 reproductive-developmental study did not detect significant effects at the limit dose of 1000 mg/kg/day. As indicated in earlier comments, EPA believes that the information provided in the Stark et al., (2013) study provides adequate evidence that additional chronic oral toxicity data are not needed, as the information provided in the reproductive and

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		developmental screening study do not indicate that chronic toxicity is expected to result from oral exposure to PV29.
111	EPA still fails to consider pregnant workers and consumers who are at higher risk, despite listing them as a PESS.	The OECD 421 reproductive-developmental study did not detect significant effects at the limit dose of 1000 mg/kg/day. The inhalation POD is based on the effects of the analogue carbon black on the lungs (alveolar inflammation & hyperplasia, etc). The physical-chemical properties of carbon black and PV29 indicate that they are insoluble and not likely to be absorbed into the bloodstream via the lungs and therefore not distributed throughout the bloodstream so the potential to cross the placenta and expose the fetus of a pregnant worker or consumer is negligible.
EPA Fails to Apply All Relevant Uncertainty Factors in Characterizing PV29 Risk.		
119	EPA applies only the following uncertainty factors in deriving a point of departure when characterizing the risks of PV29 Animal-to-Human extrapolation (UFA) – 3 (to account for toxicodynamic variability) Inter-individual variation (UFH) – 10 By EPA's own admission the MPPD model only accounts for a portion of toxicokinetic uncertainty. In the absence of any measured toxicokinetic data on PV29, the UFA uncertainty factor should be revised to 10. EPA also argues that a sub-chronic to chronic uncertainty factor is unnecessary because "the available information in animal studies support pulmonary system effects at similar concentrations following chronic exposures to carbon black particles" and "…[E]xposures in longer-term animal studies	EPA has updated its justification for the use of uncertainty factors in Section 4.2.1 of the final risk evaluation. EPA has utilized an Animal-to-Human uncertainty factor (UF_A) of 3 and an Inter-individual uncertainty factor (UF_H) of 10. EPA disagrees that it is necessary to increase the UF_A from 3 to 10. The UF_A accounts for the uncertainties in extrapolating from rodents to humans. In the absence of data, the default UF_A of 10 is adopted which is the product of a factor of 3 for toxicokinetic variability and a factor of 3 for toxicodynamic variability. There is no PBPK model for PV29 to account for the interspecies extrapolation using rodent toxicokinetic data in order to estimate internal doses. In this assessment, a portion of the interspecies uncertainty is accounted for by use of the RDDR model for estimating the deposited particle fraction in the alveolar region of the lung (internal dose) which accounts for toxicokinetics, thereby reducing the factor for toxicokinetic variability from a 3 to a factor of 1. An UF_A of 3 is retained

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	are not reasonably expected to cause equivalent nervous system effects at a lower concentration than the 13-day study by Elder et al., (2005)" (p. 72). This rationale is an unsupported assertion and is incorrect. As described in subsection C., the ECHA dossier for PV29 describes a 2-year rat study of carbon black in which effects were observed at concentrations lower than the POD EPA selected from the Elder et al. 2005 study. The dossier notes: Severe lung damage (including lung tumours) was seen in Fischer 344 rats of both sexes exposed for 2 years to 2.5 and 6.5 mg/m3 (16 hrs/day, 5 days/week) (see section on carcinogenicity for full details). The lung weights of all exposure groups increased in an almost linear manner throughout the exposure period. Exposure-related lesions consisted of alveolar macrophage hyperplasia, alveolar epithelial hyperplasia, chronic-active inflammation, septal fibrosis, alveolar proteinosis, bronchiolar alveolar metaplasia, focal fibrosis with alveolar epithelial hyperplasia, squamous metaplasia and squamous cysts (Nikula et al. 1995). EPA reliance on Elder et al. 2005 requires at a minimum that the agency apply a sub-chronic to chronic uncertainty factor of 10 barring more robust data. Lastly, given the dearth of available data for PV29, in particular for inhalation toxicity, EPA should include an additional uncertainty factor of 10 for database uncertainty. The Elder et al. 2005 study, for example, did not examine potential effects in the upper respiratory system. EPA is relying on analog data (carbon black) exclusively to characterize inhalation toxicity for PV29 and the uncertainty engendered by this decision on top of lack of any inhalation	to account for toxicodynamic differences between the test species and humans. Several non-carcinogenic effects associated with the inhalation exposure of carbon black (the analogue for PV29), including alveolar hyperplasia, inflammation and morphological changes in the lungs of rats, mice and hamsters, are adverse effects considered by EPA to be relevant to humans and require the retention of the UF_A of 3 for toxicodynamics for use in this final risk evaluation. Similarly, EPA disagrees that an additional uncertainty factor to account for subchronic to chronic duration is necessary; and a UF_S of 1 was used by EPA in this final risk evaluation. EPA considered the chronic toxicity study by Nikula et al., (1995) cited by the commenter, and has included a discussion of that paper in the final risk evaluation in Section 3.2. However, the Nikula et al., (1995) study was not used for selection of the POD because, although the LOAEC was lower (2.5 mg/m3) compared to the Elder study (7.6 mg/m^3), a NOAEC was established in the Elder study (1.1 mg/m^3) which provides a lower POD and more certainty regarding the threshold of effects. Using the LOAEC in the Nikula et al., (1995) study would require the incorporation of additional UF because a NOAEC was not established. Specifically, the rat NOAEC HEC of 0.28 mg/m^3 for PV29 risk calculations are based on the no-effect concentrations for precursor events such as inflammation and hyperplasia in the Elder et al., (2005) study, thus, a POD for downstream events in a longer duration study is not warranted, and a UF_S of 1 was utilized by EPA in this final risk evaluation. Similarly EPA is not including an uncertainty factor for the conversion of a LOAEL to a NOAEL. The noncancer POD

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	toxicity data for PV29 itself warrants the application of a database uncertainty factor.	for the carbon black analogue for PV29 is a NOAEC. Therefore, a UF_L of 1 is used by EPA in this final risk evaluation. There is no universal list of hazard data required when evaluating chemical risks under TSCA. Furthermore, for PV29, EPA has sufficient, hazard data and included the use of an analogue to support the use of the chosen hazard endpoints and conduct the risk evaluation. Therefore, EPA did not use a database uncertainty factor in the PV29 risk evaluation. While EPA acknowledges the uncertainty introduced by using an analogue to estimate the risks of PV29, the assessment uses many highly conservative assumptions in its risk calculations and additional uncertainty factors beyond those that are presented in the final risk evaluation are not needed.
113	The uncertainty factors (UFs) EPA has used to determine its Benchmark MOE of 30 are inadequate; a more defensible Benchmark MOE would be at least 1,000 and, arguably, 3,000 because of lack of data on PV29 itself. As a result, EPN is concerned that the updated EPA evaluation still understates PV29's risk to workers.	EPA disagrees that use of a benchmark MOE of 30 is inadequate. Please see the previous comment for a discussion of the uncertainty factors used in the final risk evaluation to determine the benchmark MOE and EPA's rationale for selecting the uncertainty factors. Additional discussion about these UFs is available in Section 4.2.1.
111	EPA's use of a hazard test is unsuitable for use in risk assessment, and fails to account for numerous uncertainties, such as potential differences between inhalation and oral exposure routes. Further, EPA should not use MOE (Margin of Exposure) as an analysis method in the risk evaluation process.	EPA has updated its approach to utilize analogue toxicity data characterizing inhalation hazards from PV29 instead of using a route-to-route extrapolation approach presented in earlier versions of the risk evaluation.
110	Although we support EPA's proposed unreasonable risk determination for PV29, we are concerned that EPA's	EPA disagrees that use of a benchmark MOE of 30 is inadequate. Please see the previous comment for a

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	methodology for calculating Margins of Exposure (MOEs) systematically understates the magnitude of PV29's risks to workers in two respects: (1) the uncertainty factors (UFs) EPA has used to determine its Benchmark MOE of 30 are inadequate and, properly calculated, would require a Benchmark MOE of at least 3,000 and arguably 10,000; and (2) EPA has improperly increased its MOEs to account for the protection provided by respirators despite the limited evidence for respirator use at PV29 manufacturing and processing facilities and the Agency's misinterpretation of OSHA policies and regulations to require respiratory protection for PV29 exposure. If these flaws were corrected, MOEs would be well below the benchmark MOE for high-end and central-tendency exposure scenarios and two of the three median particle sizes for all 14 of the PV29 conditions of use. Thus, an unreasonable risk determination would be required for all PV29 uses.	discussion of the uncertainty factors used in the final risk evaluation to determine the benchmark MOE and EPA's rationale for selecting the uncertainty factors. Additional discussion about these UFs is available in Section 4.2.1.
113	EPA's rationale for selecting a UF_S of 1 to account for extrapolation from a subchronic to chronic exposure duration is unconvincing, particularly in light of identifying a potential for carcinogenicity following long-term inhalation exposure to the surrogate, carbon black. In this instance, the UF_S should be at least 3.	EPA disagrees that use of a benchmark MOE of 30 is inadequate. Please see the previous comment for a discussion of the uncertainty factors used in the updated risk evaluation to determine the benchmark MOE and EPA's rationale for selecting the uncertainty factors. Additional discussion about these UFs is available in Section 4.2.1.
113	EPA selected a UF_A of 3 to account for animal-to-human extrapolation, stating that a portion of the toxicokinetic component of this extrapolation may be accounted for by use of the MPPD model for estimating the retained particle fraction in the alveolar region of the lung, and converting the animal dose (1 mg/m^3) to a Human Equivalent Concentration (HEC). There is nothing in the text or appendices that describes and illustrates mathematically the derivation of HEC, particularly the one which should be	EPA disagrees that use of a benchmark MOE of 30 is inadequate. Please see the previous comment for a discussion of the uncertainty factors used in the final risk evaluation to determine the benchmark MOE and EPA's rationale for selecting the uncertainty factors. The calculation of the HEC from the RDDR model is available in Section 3.2.3. Additional discussion about these UFs is available in Section 4.2.1.

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	serving as the POD in determining whether or not the MOE for each COU is adequate. This assessment step needs better documentation in the text – it was initially thought that this step had not been performed and only discovered by accident.	
113	We are in agreement that the Inter-individual variation UF_H should remain at 10.	EPA acknowledges the comment.
113	There is a missing UF that accounts for data deficiencies (UF_D) OPPT claims they don't use this UF, however the omission runs counter to agency guidance in (U.S. EPA, 2002) and (U.S. EPA, 2005). In this case, the database for PV29 is so lacking that this UF should be set to its maximum default of 10X.	EPA does not utilize a database uncertainty factor in its risk evaluations as a matter of policy. Please see previous comment for discussion of the lack of EPA using a database uncertainty factor. There is no universal list of hazard data required when evaluating chemical risks under TSCA. Furthermore, for PV29, EPA has sufficient, reasonably available hazard data and included the use of an analogue to support the use of the chosen hazard endpoints and conduct the risk evaluation. Therefore, EPA did not use a database uncertainty factor in the PV29 risk evaluation.
113	Calculating the total Uncertainty Factor results in a Benchmark MOE of at least 1,000,or 3,000, if one employs the full default for extrapolation of subchronic data to a chronicexposure scenario.	As discussed above, EPA disagrees that an additional uncertainty factor to account for subchronic to chronic is necessary. Specifically, the rat NOAEC HEC of 0.28 mg/m^3 for PV29 risk calculations are based on the no-effect concentrations for precursor events such as inflammation and hyperplasia in the Elder et al., (2005) study, thus, a POD for downstream events in a longer duration study is not warranted, and a UF_S of 1 was utilized by EPA in this final risk evaluation.
113	With a more appropriate Benchmark MOE of 1,000, there are no acceptable MOEs for workers without respirators for any COU; no acceptable MOEs for Occupational Non-Users (ONUs) without respirators, except those with central	EPA disagrees that use of a benchmark MOE of 30 is inadequate. Please see the previous comment for a discussion of the uncertainty factors used in the updated risk evaluation to determine the benchmark MOE and

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	tendency exposures to the 46.4 ug/m^3 particle size; no acceptable MOEs to workers using Assigned Protection Factor (APF) 10 or 25 Personal Protective Equipment (PPE), except those with central tendency exposures to the 46.4 ug/ m^3 particle size; and no acceptable MOEs for workers using APF 50 PPE, except those with high-end or central tendency exposures to the 46.4 ug/m^3 particle size. With a Benchmark MOE of 3,000, there are no acceptable MOEs for any COU except for workers using APF 50 PPE with central tendency exposures to the 46.4 ug/m^3particle size.	EPA's rationale for selecting the uncertainty factors. Additional discussion about these UFs is available in Section 4.2.1 of the final risk evaluation. EPA acknowledges that changing the MOEs would result in different risk determinations, but using the benchmark MOE of 30 still results in unreasonable risk determinations for 10 conditions of use.
Point of Departure		
113	The POD is generally defined as the measured or modeled dose administered in a toxicity study that did not result in adverse effects of concern. In Table 4-1 on page 71 of the revised draft, EPA presents a POD of 1.0 mg/m^3 as the NOAEC based upon the "lung particle increased burden and inflammation" at the next higher dose (7.6 mg/m3) reported in the Elder et al. (2005) study. Respiratory tract particle burden is NOT a measure of toxicity. It is a measure of exposure dosimetry. If 1 mg/m3 is the highest dose at which no adverse changes such as inflammatory and morphological changes in the lungs are observed, then that dose is the appropriate NOAEC to serve as the POD (once converted to an HEC). Whether or not there is coincident particle overload is irrelevant.	EPA has updated its approach to convert the NOAEC into an HEC and describe effects in terms of physiological effects rather than in terms of kinetic lung overload.
Risk Estimation and Characterization		
113	We agree with Ecological Structure Activity Relationships (ECOSAR) (ver. 2.0) guidance for predicting acute and chronic effects to aquatic organisms that PV29 may not be sufficiently soluble to measure predicted effects for each	EPA agrees with the comment and has made no change to this analysis in the final risk evaluation

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	species, and that, if effect levels exceeded the water solubility by 10-fold, typically "no effects at saturation" is reported. This approach is consistent with standard practices in the testing industry.	
113	Given its low solubility in water, its limited environmental releases, and lack of environmental hazard, EPA determined that PV29 does not present an unreasonable risk to aquatic species in the water column and sediment, and to terrestrial species. We agree with EPA's determination that there is no unreasonable risk of injury to the aquatic and terrestrial environment from all conditions of use of PV29.	EPA agrees with the comment and has made no change to this analysis in the final risk evaluation
113	Based on PV29's low vapor pressure and volatility and low solubility, exposures to terrestrial species through air and water are not expected, so risk concerns for terrestrial species are not identified.	EPA agrees with the comment and has made no change to this analysis in the final risk evaluation
113	Given the expanded discussion in the revised draft risk evaluation, we agree with the agency's assessment that no adverse effects were observed in results from laboratory testing for acute exposure to microorganisms, aquatic plants, aquatic invertebrates, and fish up to the limit of PV29 solubility, 3 μg/L.	EPA agrees with the comment and has made no change to this analysis in the final risk evaluation
113	On Page 75 of the document, EPA states "Because the exposure estimates and hazard assessment for inhalation exposures to C.I. Pigment Violet 29 are considered to be of high uncertainty and low confidence, the confidence in the risk estimation is considered to be low." EPN agrees with this conclusion but believes that there is an adequate basis for a determination of unreasonable risk. EPA should require additional studies to provide greater certainty in its risk estimates.	EPA believes that sufficient data (both hazard and physical chemical property data) exist for PV29 to make a determination that risks are not expected for environmental receptors under the conditions of use of this risk evaluation.
EPA Lacks Critical Data		

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105	Solubility: CPMA defines color pigments as colored or fluorescent particulate organic or inorganic solids that usually are insoluble in, and essentially physically and chemically unaffected by, the vehicle or substrate in which they are incorporated. This insolubility is key to the functioning of color pigments, which as noted earlier retain a crystalline or particulate structure in the larger matrix in which they are encapsulated and impart color by selective absorption or by scattering of light. The revised draft finds that the solubility tests performed under the Section 4 test order "confirm that C.I. Pigment Violet 29 is an insoluble particulate substance; that there is no expectation that C.I. Pigment Violet 29 will be taken up by fat solubility; and confirms that C.I. Pigment Violet 29 is not expected to bioaccumulate." These test results thus confirm previous findings regarding other color pigments. Taken together with those other findings, they add further support to the weight of evidence conclusion that color pigments, in general, are not bioavailable, do not bioaccumulate and do not bioconcentrate in the food chain, due to their extremely low solubility, in both lipids and water.	EPA agrees with this comment and has presented similar points in the final risk evaluation.
119	Data voluntarily submitted to EPA by manufacturing stakeholders is insufficient and speaks volumes about the limitations faced by EPA when it relies on voluntary information requests instead of using its TSCA authorities to require companies to submit such information	EPA acknowledges the comment on information collection. In February 2020 EPA did use its TSCA authority to collect new data on PV29. The Section 4 Test Order required solubility in water, solubility in octanol and inhalation monitoring at the manufacturing facility tests. Results from these data are discussed in the final risk evaluation.
106	The revised draft risk evaluation sets a problematic precedent for chemicals manufactured in batch processes, with respect to the monitoring data test order. It is not reasonable to expect workplaces to conduct sampling for	Prior to the initiation of any testing, EPA recommends engaging in discussions to clarify any uncertainties and ensure that the testing plan accounts for all limitations in a mutually agreeable manner. In the case of the NIOSH 0600

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	periods longer than are required by NIOSH 0600. To assume otherwise would bias the risk evaluation process whenever chemicals are manufactured in batch processes.	test conducted by Sun Chemical, several deficiencies were identified in the final study that were not identified in the study plan or properly communicated to EPA. These issues resulted in significant uncertainties in the study that impacted the usability of the results of this study.
106	Sun Chemical went to great expense to comply with the Section 4 test order. It is surprising and unfortunate that EPA propose not to use some of the information generated by the test order. The final risk evaluation should incorporate all of the test results, not just the results of the solubility testing. That "employees…only spent a fraction of their shift (approx. 0.5-2 hrs) actually handling [PV29]" is not a "deficiency" of the study, it is an unavoidable condition of batch manufacture.	These issues were not communicated to EPA prior to the initiation of the test. These resulted in significant uncertainties that impacted the utility of the testing. EPA is utilizing the information presented in the dust monitoring study but because of deficiencies with the study, EPA needed to make several assumptions in order to understand the potential exposures during a full work shift. Prior to the initiation of any testing, EPA recommends engaging in discussions to clarify any uncertainties and ensure that the testing plan accounts for all limitations in a mutually agreeable manner.
106	EPA's risk evaluation needs to accommodate the commercial reality that batch manufacturing allows facilities to maintain flexible and responsive commercial operations to handle specialized chemistries and meet diverse customer demands.	Prior to the initiation of any testing, EPA recommends engaging in discussions to clarify any uncertainties and ensure that the testing plan accounts for all limitations in a mutually agreeable manner. In the case of the realities of batch manufacturing, as EPA indicated in its review of the final respirable dust monitoring study provided by Sun Chemical (available in Appendix I of the final risk evaluation), extending the respirable dust collection period beyond the activities where PV29 was being produced would have allowed EPA to adequately characterize full shift exposure without needing to rely on the assumptions outlined in the exposure section of the final risk evaluation (see Section 2.3.1 of the final risk evaluation).
106	EPA's assumption that the unsampled portion of the work shift had the same average exposure to PV29 as the sampled portion overestimates potential exposure. This approach is	As indicated above, the deficiencies of the NIOSH 0600 respirable dust monitoring study conducted by Sun Chemical meant that EPA needed to make several assumptions to model the potential full-shift exposure to

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	incorrect and inconsistent with standard industrial hygiene practice for this type of batch process operation.	PV29. If the study authors extended the sampling period beyond the times where PV29 was being manufactured, it would have provided a quantitative estimate of exposure. Instead, in the absence of such data, EPA assumed that potential exposure reported in the monitoring study extended throughout the length of the shift. The only alternate assumption, the exposure between batches of PV29 is essentially zero, is not appropriate because it would ignore the presence of ambient dust, as well as reaerosolization of workplace dusts from activities such as cleaning. Additional information, as well as a full review of the respirable dust monitoring study with a full discussion of the deficiencies is available as an Appendix I of the final risk evaluation.
119	Based on ECHA-REACH recommendations, toxicokinetic studies as well as static and dynamic dissolution assays should be performed to support their claims of poor absorption and low bioavailability. Solubility is not sufficient to make a determination of a lack of bioavailability via oral and dermal pathways.	While toxicokinetic studies as well as static and dynamic dissolution assays are optimal studies to understand the potential for these processes to occur, the solubility studies available for PV29 are sufficient to make a determination that solubility and bioavailability are low for PV29.
113	EPN disagrees with EPA's argument that, because of its purported lack of solubility, PV29 lacks the potential for inducing acute and chronic health effects (with the exception of lung toxicity following inhalation based upon its comparison with carbon black). The evidence of insolubility is not clear-cut; there are suggestions of toxicity in the limited number of studies on PV29, and it cannot be assumed that insolubility definitively rules out the possibility that PV29 will be distributed to tissues and organs within the body and cause toxic effects, especially when inhaled. EPA therefore lacks a basis to determine that PV29 is without health effects other than lung toxicity following inhalation and must require testing to make	EPA acknowledges the commenter's request for a 90-day subchronic study on PV29 in the TSCA Section 4 Test Order; however, the test was not requested by the Agency because the Agency believes that the risk evaluation could still be completed without the information, as reasonably available data are sufficient to make a risk determination.

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	informed judgments on the issue. At a minimum, required testing should include a 90-day subchronic inhalation study along with appropriate shorter-term *in vivo* and/or *in vitro* studies designed to characterize the mode of action of the lung effects and examine the potential for carcinogenicity.	
119	EPA lacks acute inhalation toxicity studies for PV29, since the two identified in the ECHA database were found to be unacceptable. EPA should require acute, sub-acute, and chronic inhalation toxicity studies of PV29.	EPA acknowledges the commenter's request for a 90-day subchronic study on PV29 in the TSCA Section 4 Test Order; however, the test was not requested by the Agency because the Agency believes that the risk evaluation could still be completed without the information, as reasonably available data are sufficient to make a risk determination.
111	EPA still does not have adequate information to conclude that Pigment Violet 29 does not pose an unreasonable risk and still failed to assess all relevant health hazards…Using its full authorities under TSCA sections 4 and 8, EPA must request additional test data (compliant with established standards) to fill critical health data gaps for Pigment Violet 29.	EPA acknowledges the commenter's request for additional information; however, the Agency believes that the risk evaluation could still be completed without the information, as reasonably available data are sufficient to make a risk determination.
111	EPA still assumes that Pigment Violet 29 is non-toxic and not absorbed via inhalation without providing adequate empirical data to support such assumptions.	Additional data generated as a result of the Section 4 test order provides additional evidence that solubility in both octanol and resulting absorption potential is low. EPA is using carbon black as an analogue for PV29 which has adverse effects in the lower respiratory tract.
110	In our initial comments, we argued that the many data-gaps for PV29 required EPA to use its TSCA section 4 authority to reliably characterize its toxicological properties. Unfortunately, the revised draft evaluation continues to dismiss concerns for any health endpoint other than inhalation toxicity on the unsupported basis that PV29's purported lack of solubility and bioavailability prevent its systemic absorption and distribution throughout the body. In fact, PV29's insolubility has not been clearly established by	EPA acknowledges the commenter's request for additional information; however, the Agency believes reasonably available data are sufficient to conduct a risk evaluation and make a risk determination. The EPA has determined that the studies indicated by the commenter are not necessary because EPA has sufficient data to reach a conclusion regarding the potential absorption, uptake, and inhalation effects of PV29. As indicated in the final risk evaluation, these effects are characterized through the

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	available studies and in any case lack of solubility is insufficient in itself to rule out uptake of PV29 and systemic toxicity. We therefore urge that EPA use its section 4 authority to require studies to (1) examine whether there is absorption and uptake of PV29 by all routes (oral, dermal and inhalation) and, if so, whether PV29 causes systemic toxicity, and (2) further elucidate PV29's cancer and non-cancer inhalation effects by testing PV29 directly for these endpoints Once this testing is completed, a supplemental risk evaluation and/or additional risk management may be warranted. In the interim, EPA should finalize unreasonable risk determinations for PV29 based on the known lung toxicity and carcinogenicity of the carbon black surrogate	solubility information provided in response to the Section 4 test order, which confirms the low solubility of PV29 in water and octanol, as well as the toxicity information available on the analogue carbon black.
121	EPA's proposed determination of no unreasonable risk to the environment from all uses of Pigment Violet 29 is based on limited analysis, fails to examine chronic impacts of a persistent chemical, and relies on a broad assumption that environmental releases and concentrations are limited.	EPA disagrees with the comment. EPA has sufficient data to determine that, under the conditions of use in the risk evaluation, environmental risks are not identified. In Section 3.1 of the final risk evaluation, EPA incorporated modeling approaches to confirm the preliminary conclusions from the draft risk evaluation.
121	EPA's proposed determination of no unacceptable risks to the public and to consumers is not supported by adequate testing or monitoring data and not based on a comprehensive assessment of potential exposures to Pigment Violet 29 from products, building materials, and the environment.	Monitoring of PV29 exposure to the public is not necessary because of the few consumer products available and the nature of the pigment in these products. As discussed in the final risk evaluation, use of finished plastic or rubber products containing PV29 are not expected to result in risk, as the pigment particle is confined to a matrix such as plastic or rubber, thereby making it unlikely to leach out. The only activities where potential risks are expected as a result of PV29 uses are activities where PV29 is handled directly as a powder or spray applied as part of a paint, or if the pigment is released during sanding of automotive paints. EPA did not identify uses of PV29 in building materials.

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121	EPA's apparent focus on respirators to mitigate occupational exposure risks from use of Pigment Violet 29 is not adequately informed by comprehensive toxicological testing or by exposure assessments in downstream processing facilities and industrial/commercial sites.	EPA has received information outlining PPE usage by manufacturing stakeholders of PV29. EPA determined that this information is suitable to understand the potential PPE use in a typical production facility. To further understand potential risks, EPA has calculated risks with and without PPE. For most conditions of use of PV29 with an identified risk for workers, EPA evaluated the use of a respirator. However, EPA assumes that for some conditions of use, the use of appropriate respirators is not a standard industry practice, based on best professional judgement given the burden associated with the use of respirators, including the expense of the equipment and the necessity of fit-testing and training for proper use. For manufacturing, processing, recycling, and disposal conditions of use, air-purifying respirators (*e.g.* half face dust masks) with an APF of 10 were assumed. For one condition of use, paints and coatings for automobile (*e.g.*, Original Equipment Manufacturer (OEM) and refinishing), EPA assumed the use of a supplied-air respirator (continuous flow mode) with an APF of 25. For the remaining industrial, commercial, and consumer conditions of use, EPA assumed no use of a respirator. The PPE assumptions for all the conditions of use did not affect the unreasonable risk determinations made. Only with an assumption of PPE use with APF of 50 would eliminate unreasonable risk; however, the final risk evaluation does not use that assumption for any condition of use.
121	EPA's evaluation of risks to workers during recycling and disposal of Pigment Violet 29-containing materials is not	EPA has a limited understanding of the potential recycling activities for PV29. EPA determined that there is potential

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	sufficiently detailed to inform its future risk management determinations. EPA's determination that recycling (processing) and disposal of Pigment Violet 29 presents unreasonable risks to human health are of particular interest to local agencies that provide or contract for these services. However, the revised draft risk evaluation identifies no specific data on exposures or Pigment Violet 29 releases in recycling and waste facilities. Further analysis or direct testing is needed to verify EPA's assumption that Pigment Violet 29 remains irreversibly encapsulated in the matrices of materials during different recycling processes and waste disposal methods. Without additional analysis, it is unclear how EPA can develop evidence-based recommendations for its subsequent risk management actions to ensure workers are protected and environmental releases are prevented.	for exposure to PV29 if plastic products are recycled through grinding or milling and PV29 is released. As a result, EPA made several assumptions to estimate exposure through these activities. EPA acknowledges that there are uncertainties with this approach.
Use of Multiple-Path Particle Dosimetry (MPPD) Model was not Appropriate for the Risk Evaluation		
105	EPA supported its use of carbon black as a surrogate by predicting the retained mass in the pulmonary region of rats using Multiple-Path Particle Dosimetry (MPPD) modeling, incorporating the characteristics and administered doses of carbon black in Elder et al. (2005). However, EPA does not appear to have calculated a relative ratio of the retained dose for rats *relative* to humans. As discussed in detail by the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC), there are critical differences in particle lung translocation patterns between rats and humans, and humans are less sensitive to developing comparable lung overload conditions. Thus, the rat lung model is an unreliable predictor for risk to the human lung from chronic exposures to particles.	EPA recognizes that particle overload is a kinetic phenomenon and not an adverse effect per se. The Agency has revised the text in the final risk evaluation to provide this clarification. In addition, the definition of overload and how it is used to create context for the evaluation of any observed toxicities has been provided. The final risk evaluation discusses several other "noncancer" events such as inflammation and hyperplasia, and how they are relevant and related to other adverse outcome pathways and should be evaluated as relevant to humans (U.S. EPA, 2019). EPA could not calculate a relative ratio of the retained dose using the MPPD model due to a lack of adequate information on particle size distribution data for PV29. Therefore, EPA used the RDDR model instead. However, this model calculates the deposited dose ratio, not the retained dose ratio, in various regions of the respiratory

#	Summary of Public Comment	EPA/OPPT Response
		tract between rats and humans. EPA has updated its approach to calculate a human equivalent concentration (HEC) for carbon black in the final risk evaluation utilizing the RDDR model. The carbon black study compared the results of rats, mice and hamsters to determine the most sensitive species after exposure to carbon black via inhalation. The RDDR model was utilized as a dosimetry refinement to the risk evaluation since the MPPD model does not model hamster data in the Elder et al. (2005) study relative to the rats and mice data.
CBI/ Data Access Issues		
113	To obtain better (and valid) partition coefficient data and particle size information, EPA issued a test order under TSCA section 4 to obtain new data on PV29's solubility in water and octanol and exposure data in the work setting. Information on these parameters was provided. Regrettably, it is not possible to answer the question of EPA's initial conclusion of "no unreasonable risk," as the Nicolaou (2020) study is restricted access (presumably meaning Confidential Business Information (CBI)) and cannot be independently evaluated, and the link EPA (2012c) leads to no data on this chemical. However, even if we had access to the details of the Nicolaou study, it would not show that PV29 lacks the potential to produce adverse health effects in the absence of additional, relevant toxicity testing.	The Nicolaou (2020) study contains no confidential business information. The restrictions on the full study report and some attachments in the public docket is from copyright claims. Anyone from the public can request full access to the restricted documents in the docket's reading room. Reasonable accommodations as a result of the pandemic can be arranged on a case-by-case basis by contacting the reading room staff. EPA disagrees that this study is not informative of potential health effects from PV29. While this study is not a hazard study, the lack of solubility in water and octanol can inform the potential for absorption from oral, dermal, and inhalation exposure.
119	EPA has no basis for not providing full public access to the solubility study (Nicolaou, 2020). The reading room where the study is available is currently closed due to the global pandemic.	The reading room is open by appointment only. For further guidance visit the EPA's reading room webpage: https://www.epa.gov/dockets/epa-docket-center-and-reading-room-closed-public-limited-exceptions. Upon request, reasonable accommodation can be made for access.

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105	EPA properly allowed study owners to redact some confidential business information (CBI). The owners of 24 toxicological study reports that had previously been claimed as CBI ultimately allowed EPA to release the full study reports, evidently to prevent EPA from refusing to consider them. The revised draft indicates that for nine reports, however, EPA allowed the redaction of "personal information relating to laboratory personnel, certain company-related information and, in one instance, individual test animal data tables." This is a positive precedent for future risk evaluations. CPMA has consistently argued that, even as EPA requires the release of health and safety data, EPA can and should allow study report owners to claim as CBI the sort of identifying information that does not bear on interpretation of the study, but does affect the ability of non-owners to submit the study to approving agencies in other countries	EPA acknowledges the comment. EPA will continue to update its approach for handling CBI information received for future risk evaluations.
Peer Review Process		

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113	The extension notice does not state whether or not the peer review comment period was extended for 20 days as well. Completing the peer review comment period before the public comment period is a backward approach to peer review and inconsistent with EPA's own agency peer review guidance. The revised risk evaluation is essentially a brand new document and therefore should be sent back to the peer review panel in a public setting, not to a small group of individuals in a closed, non-transparent letter-review process. The agency would be better served if it sought consultation with the full SACC, adding a person or two in the key area of inhalation toxicology.	An earlier draft risk evaluation underwent peer review by the full SACC in 2018-2019. The final risk evaluation incorporates changes in response to those comments and before finalization underwent a further 30-day letter peer review and a public comment period of 45 days. The peer review comments, and EPA's responses are transparently documented in this Response to Comment document. The revised draft risk evaluation that was reviewed by the letter peer reviewers incorporated responses and comments proposed by previous rounds of public comments as well as key recommendations of the SACC. EPA utilized members of the previous SACC panel and other subject matter experts relevant to the areas that were revised in response to input provided by the SACC.
110	EPA is seeking a limited "letter review" of the revised draft evaluation by a small subset of its Science Advisory Committee on Chemicals (SACC) and eliminating the public comment process normally part of SACC review. EPA should reconvene the entire SACC to review the revised draft and afford the public an opportunity to submit comments and make presentations to the SACC.	As stated above, the comments received by the SACC were incorporated into the final risk evaluation. Major changes made to the risk evaluation since the SACC were subject to a letter peer review.
Concerns that the TSCA systematic review method does not follow best scientific practices		
UCSF	EPA should use a peer-reviewed, validated systematic review method for chemical evaluations instead of "Application of systematic review in TSCA risk evaluations."	EPA/OPPT's quality evaluation method was developed following identification and review of various published qualitative and quantitative scoring systems to inform EPA's specific fit-for-purpose tool. The development process involved reviewing various evaluation tools/frameworks (*e.g.*, OHAT Risk of Bias tool, CRED, etc.; see Appendix A of the *Application of Systematic Review in TSCA Risk Evaluations* document and references therein), as well as soliciting input from scientists based on

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		their expert knowledge about evaluating various data/information sources specifically for risk assessment purposes. While EPA's/OPPT's systematic review process may differ from other procedures or guides, it was developed specifically for the TSCA risk evaluation process and included certain protocols and processes. Based on comments received and challenges experienced with EPA's/OPPT's process for the first round of risk evaluations, EPA is refining it systematic review process for added transparency and clarity. Additionally, the refinement process includes more detail, specificity, and data integration than previously applied as well as developing clearer, more transparent processes and practices to be applied in future risk evaluations.
UCSF	The Pigment Violet 29 evaluation still does not use a pre-established protocol as required by EPA regulation under TSCA.	EPA appreciates the comments and is currently in the process of updating its Systematic Review protocol. In addition, EPA has sought feedback from the National Academies of Science (NAS) on its Systematic Review process, including data evaluation criteria and data quality rating methods used in TSCA Risk Evaluations. The NAS webinars occurred from June through August 2020. EPA will consider all comments and feedback received in updating its Protocol
UCSF	The TSCA method does not have a pre-established protocol or methods for evidence integration as required by EPA regulation under TSCA.	

Response to Peer Review Comments

Charge Question 1: Based on the available data, do you agree with the conclusion that C.I. Pigment Violet 29 has extremely low solubility in octanol and water? Do you also agree with EPA's determination that log Kow is not a relevant property for this chemical? Please explain your answers and provide any other information that would inform EPA on the physical/chemical properties of C.I. Pigment Violet 29.

Charge Question 2: Does EPA's approach to inhalation exposure estimates make appropriate use of the received test data? Have uncertainties associated with the inhalation exposure estimates been adequately addressed? Please provide a rationale to your answer.

Charge Question 3: Do you have any specific recommendations to improve EPA's calculation of inhalation exposures for C.I. Pigment Violet 29 based on the two available sets of breathing zone data?

Charge Question 4: Please provide any additional suggestions or additional factors that EPA should consider in estimating central tendency and high-end exposures for C.I. Pigment Violet 29 in the manufacturing workplace air.

Charge Question 5: Is EPA's determination that carbon black matches the critical properties of C.I. Pigment Violet 29 and is an appropriate surrogate reasonable? If not, please provide suggestions of surrogates that may be better as a surrogate for C.I. Pigment Violet 29, along with additional justification for why the alternative surrogate is better than carbon black.

Charge Question 6: Are there other critical characteristics that should be considered in the selection of a surrogate? If so, provide detailed additional substantive information that EPA should consider.

Charge Question 7: Please provide any additional recommendations that EPA should consider for estimation of risk for conditions of use downstream from the original manufacturing site. What alternative assumptions could EPA make considering the lack of specific measurements of C.I. Pigment Violet 29 in air in downstream processing facilities?

Charge Question 8: EPA combined data for particle size from data sets that are independent of the data sets for concentrations measured in the breathing zone. Considering this, EPA calculated risks using the range of reported median particle sizes from small (0.043 µm), medium (10.4 µm) and large (46.9 µm) for both central tendency and high-end exposures. Is this matrix appropriate for estimation of the range of risks for OUs and ONUs? If not, please provide specific recommendations concerning alternatives that would provide less uncertainty in the risk characterization.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
1	In the TSCA Section 4 Test Order study results (Nicolaou, 2020)no test material was observed in either water (Organisation for Economic Co-operation and Development (OECD) 105 flask method) or octanol (ETAD method, 2005) (Table 1-1). Again, Log K_{ow} could not be determined. The revised draft risk evaluation states, "Due to low solubility of C.I. Pigment Violet 29, Log K_{ow} was determined not to be an irrelevant property for C.I. Pigment Violet 29." The statement should be revised as follows, "Due to low solubility of C.I. Pigment Violet 29, LogK_{ow} could not be included in the risk assessment process." Purity and solubility data in Table 1-1 use new data. Henry's Law Constant is included. Overall, information pertaining to the physical and chemical properties has been improved to some extent. Per the *Revised Draft Risk Evaluation*, EPA now views log K_{ow} as irrelevant for PV29. It would be better classified as indeterminant. If log K_{ow} could be determined, it would at least be of interest. It may well be that log K_{ow} cannot be accurately determined for this compound given available analytical methodologies.	EPA incorporated the suggested revision to characterize log Kow as "indeterminant" into the final risk evaluation. The solubility determination was limited by the sensitivity of the equipment used to carry out the experiment. In this case, and for the purposes of the Test Order and final risk evaluation, EPA determined that the methodology used in this assessment were sufficient to fulfill the requirements of the Test Order.
2	This Letter Peer Reviewer concurs that based on the available data, PV29 has extremely low solubility in both octanol and water. Based on this data, it is highly unlikely to partition into either a hydrophilic or lipophilic media, thus negating the usefulness of the log K_{ow} for predictive purposes. Predicting the log K_{ow} from the independent solubility assays also has the potential, depending on the ratio of the two, to give the wrong prediction with regards to bioaccumulation (*e.g.*, should octanol solubility be	EPA agrees with the comment and has not predicted the log K_{OW} from the solubility assays in the final risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	significantly lower than water solubility, even when both are of extremely low solubility, the log of that ratio can still be high enough to predict bioaccumulation or vice versa), further making the use of individual solubility data inappropriate for this effort.	
3	PV29 likely has very low water solubility. The new data submitted represents a reasonable amount of work. However, the data provided do not necessarily support the claim of unmeasurable water solubility or unmeasurable octanol solubility.	The solubility data provided to the EPA indicate that PV29 is functionally insoluble down to the limits of detection of the instruments used to conduct the experiment. Given the low limits of detection reported for the instruments, EPA has determined that this information is sufficient to make a solubility determination for this chemical.
4	The available information does indicate that PV29 is poorly soluble in both water and octanol and has a high melting point. However, that information appears to have been generated within the manufacturer's facilities rather than in an independent testing laboratory. Given that some information provided by the manufacturer in the course of the review has been superseded or otherwise judged unacceptable, an independent determination would have been preferable. The methods used to determine solubilities are described in detail ((Nicolaou, 2020 and appendices) and appear appropriate, but this reviewer is not an analytical chemist and may have overlooked some important detail. A claim of GLP is stated. The *Revised Draft Risk Evaluation* does not explicitly state whether EPA agrees that the laboratory practices were consistent with GLP and meet requirements under TSCA Section 4. EPA should clarify this point. Generally, substances that are poorly soluble in water *and* in octanol *and* are characterized by high melting point are	As part of the section 4 Test Order, the EPA indicated that the testing organization was required to, "For purposes of satisfying the requirements of this Order, you are required to follow the Good Laboratory Practice (GLP) standards described in 40 CFR part 792 as specified in the Code of Federal Regulations on the day this order is signed. You are also required to provide a statement of compliance with these standards when submitting information to the EPA pursuant to this Order." The testing submitted to fulfil this test order included a GLP claim and was therefore determined to fulfil this requirement. EPA acknowledges the uncertainties surrounding the determination that low solubility precludes absorption. Where appropriate, EPA has modified the statements to more accurately describe the properties of PV29. Regarding the high-quality rating of the EPI Suite™ QSAR software package, EPA acknowledges that this does not apply specifically to PV29, but to the model. EPA will update the confidence statements in the assessment to

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	expected to have poor absorption characteristics in mammals. However, poor solubility in only water or only octanol does not preclude efficient absorption. As was pointed out during the SACC Review of the PV29 Draft Risk Evaluation, many pollutants of concern possess very low aqueous solubility (*i.e.*, lower than the original estimate for PV29 of <11 ug/L), but are well known to be efficiently absorbed via the human gut (e.g., all seven of the polycyclic aromatic hydrocarbons (PAHs) EPA currently designates as carcinogens). In the *Response to Support the Revised Draft Risk Evaluation of C.I. Pigment Violet 29* on page 46, EPA acknowledges this criticism and claims that "EPA has updated the final [sic] Risk Evaluation to remove these statements." Nevertheless, in at least three places in the *Revised Draft Risk Evaluation*, inappropriate claims are made: Page 45: "Any C.I. Pigment Violet 29 incidentally ingested is unlikely to be absorbed from the digestive tract into the bloodstream based on its low water solubility (<0.003 mg/L) (Nicolaou, 2020)." Page 60: "Absorption of C.I Pigment Violet 29 after oral ingestion is expected to be limited due to the low water solubility (0.003 mg/L) and dermal and oral absorption are estimated to be poor for the neat material (because it is a solid with low solubility) (Nicolaou, 2020)." Page 61: "Additionally, physical and chemical properties indicate that, if found in these media and ingested, absorption would be expected to be poor due to low water solubility." In the revised Table 1-1, (page 20) EPA asserts "high confidence" in the estimated Henry's Law constant for PV29. This evaluation is based on a general evaluation of EPA's EPI Suite™ QSAR software package, rather than a	acknowledge uncertainties about PV29 and the use of the model. Similarly, a footnote on Pg 20 of the final risk evaluation will be added to better describe the uncertainties related to the calculation of Henry's Law Constant.

#	Summary of Comments for Specific Issues Related to Charge Question 1	EPA/OPPT Response
	specific result for PV29. Quantitative structure-activity relationship (QSAR) packages are calibrated against and work best for compounds that fall into well-studied chemical classes and that do not exhibit extremely low solubilities in air, water or common solvents. PV29 is apparently an outlier. Confidence in properties predicted for PV29 by QSAR should be low. Footnote #3 (on page 21) should revised accordingly. For compounds that are liquids at room temperature, a good estimate of Henry's constant can be generated by dividing vapor pressure by aqueous solubility. For solids this method is less reliable and provides only a first approximation. For PV29, neither vapor pressure nor aqueous solubility are well characterized. Log K_{ow} is now found to be indeterminant and the prior EPI Suite™ estimate included in the *Draft Risk Evaluation* has now been rejected. The EPI Suite™ Henry's constant estimate (10^{-21} atm·m^3/mol) should be treated similarly. The EPI Suite™ estimate could easily be (and likely is) wrong by multiple orders of magnitude.	
5	I agree with the EPA's assessment of solubility and the partition coefficient for PV29. However, in addition to the properties already mentioned, I suggest addressing the chemical reactivity of the test substance. Carboxamide functional group as a structural feature may have the potential to react locally with the respiratory tissues. The need for this information here is further addressed in answers to questions 5 and 6.	The functional group is an imide. However, there is SDS information that residual anhydride content is present in PV29 which is a concern for dermal and respiratory sensitization. The assessment has been updated to include a discussion of the potential for residuals to cause respiratory sensitization.

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
1	The data source for occupational exposure was ranked at the high confidence level. The occupational exposure assessment covers manufacturing, processing and distribution in commerce. Personal breathing zone data (NIOSH 0500) were used to estimate occupational exposure. Various protection factors in different scenarios were assigned. Time-weighted average exposure concentrations considering shift and breaktime were determined. I have a couple of comments. First, the sample sizes (*i.e.*, numbers of individuals tested) tend to be small, which may lead to statistical uncertainties. Second, the air sampling experimental design has a flaw due to low concentrations in the air; the sampling duration needs to last longer with a higher flow rate. This deficiency might have compromised the data confidence level. Third, due to the sampling issues, the accuracy of using LOQ/2 remains uncertain. The consumer exposure assessment includes consumers and bystanders. Users of products that contain C.I. Pigment Violet 29 (PV29) include watercolor artists and acrylic painters. It was determined that inhalation is not an issue to consumers and bystanders as the chemical is not volatile from paints due to its low vapor pressure. Absorption via oral ingestion is unlikely due to insolubility in water. General population exposure was determined to be negligible due to engineering controls on manufacturing releases, low volatilization rates that limit air releases in incineration process, as well as high removal efficiency of PV29 during the wastewater treatment process. Consumer exposure was assumed to be negligible because it is not present in a dust form and therefore not respirable. Further it was assumed not to leach out products due to the insoluble nature. Collectively, although no monitoring data exists, these assumptions are reasonable and associated uncertainties is low	EPA agrees with the reviewer's comments regarding the deficiencies identified in the personal breathing zone study used to estimate occupational exposure as well as the potential for exposure to consumers and commercial users from finished products containing PV29. EPA has added an in-depth discussion about the uncertainties regarding the use of the personal breathing zone data in Section 4.2.3 of the final risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
	due to the obvious chemical nature of PV29. EPA places medium confidence in the strength of the conclusion is understandable.	
2	I concur with EPA's approach to inhalation exposure estimates based on the received data. EPA has done its best to address the uncertainties based on these data. It is unfortunate that longer sampling periods for workers were not available, or alternatively, that a 12-hour sample at the point of exposure was not available (placed approximately where a worker would stand but left for the entire processing day). With these limitations, and the limited material to sample, EPA has adequately accounted for exposures.	EPA acknowledges the reviewer comment.
4	The preface to Question #2 contains the following statements: "Individual exposures of respirable dust for six workers in the Sun Chemical 2019 Study ranged from 0.22 to 1.2 mg/m^3." and "For further information on the Sun Chemical 2019 Study refer to Table 1-2 in Section 1.1 of the revised draft risk evaluation." These statements are incorrect and may confuse members of the public. They should be corrected when responses are compiled. As was discussed at the June 2019 SACC review for the Draft Risk Evaluation, the relevant particle size for assessment of risk of inhalation exposure is the size of the particles suspended in the breathing zone, not the size of the particles in the product package. Handling of powders generally results in preferential suspension of finer particles. Therefore, the inhaled particle median is likely to be finer (and present greater risk) than the package median. Nevertheless, EPA continues to use bulk material particle size in its analysis. In the *Supplemental File: Information Received from Manufacturing Stakeholders*, three Particle Size Distribution (PSD) estimates can be found. They are summarized (as median values) in the following table along with the corresponding	EPA agrees with the reviewer's comment. The updated preface to the comment should read, "Individual exposures of total dust for five workers in the Sun Chemical 2019 Study ranged from 0.22 to 1.2 mg/m^3." and "For further information on the Sun Chemical 2019 Study refer to Table 2-4 in Section 2.3.1.2 of the final risk evaluation." EPA has clarified in the final risk evaluation that in order to estimate high-end exposure in the workplace, EPA has conservatively assumed that 100% of the measured dust concentration is comprised of PV29. The particles size demonstrates a polydisperse distribution of sizes, from low nm to um sizes, presumably from grinding of the PV29 for various applications. EPA did not receive particle size distribution for actual workplace dust collected in the manufacturing facility. In an attempt to capture uncertainties and capture all information provided to the EPA to characterize the particle size distribution of the chemical, EPA included all particle size distributions in the analysis presented in the draft Risk Evaluations. EPA did not specifically discuss the PSD estimates from the BASF SDS because they were within

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
	statistic reported by BASF that was utilized in the Draft Risk Evaluation. Three of the four values were utilized in EPA's modeling of potential lung overload. For unexplained reasons, EPA included an older value from a published BASF Safety Data Sheet (SDS) in the Supplemental File (page 55) but did not use that value in the *Revised Draft Risk Evaluation*. EPA should determine why the original submittal for the PV29 review (BASF, 2013) does not correspond to the SDS (which is apparently still considered current?). (EPA should also consider whether it is helpful to label the second (laser diffraction) PSD study received by EPA as Sun Chemical #1 and the first (TEM) study as Sun Chemical #2 in Table 1.2 of the *Revised Draft Risk Evaluation*). Regarding the four PSD medians, gross differences among them suggest high uncertainty that is further compounded by uncertainty generated by using bulk packaged product median particle diameter rather than suspended particle median diameter. Indeed, the NIOSH 0600 Respirable Particle method used to collect the Test Order workplace data set has an estimated median cut point of 4 µm, making the Test Order results simply incompatible with the two larger medians applied to the lung overload calculations. The smallest particle size assumed is more conservative (although perhaps not conservative in an absolute sense since suspended dust might be finer still). Given limited and inconsistent data, EPA is justified in making conservative assumptions.	the range of the existing particle data provided by Sun Chemical. In addition, EPA has updated its use of particle size information to use primarily as a judge for the appropriateness of the carbon black analogue. This is primarily based on the smallest particle size measurement of 0.043 µm provided by Sun Chemical. EPA agrees that workers in a manufacturing facility will be exposed to respirable dust. Particle sizes below 10 µm are considered respirable in humans and are likely the main component of the personal breathing zone data provided to the EPA in response to the Section 4 Test Order. In the final risk evaluation, the EPA is removing the discussion of particle size as it relates to the modeled deposition in the lungs. As a result, it is expected that respirable particles will be deposited in the lungs and the particle size data received for PV29 has been used primarily to determine whether carbon black is an appropriate analogue to characterize the inhalation hazards of PV29. Inhalation of respirable, poorly soluble particles can increase their lung burden. Particles are retained in the lungs when the deposition rate exceeds the clearance rate. Depending on the exposure magnitude, retained particles may cause kinetic lung overload.

#	Summary of Comments for Specific Issues Related to Charge Question 2	EPA/OPPT Response
6	EPA appears to have reasonably utilized the PV29 concentration data from the Test Order Study provided by the Sun Chemical. The central tendency is based on the average of PV29 concentrations (or TWAs). All but one sample of the Test Order Study were below LOQ. The true sampled value is somewhere below LOQ along a (truncated) probability distribution; the distribution however is unknown. In addition to LOQ/2, other values such as √LOQ/2 or LOQ have also been used in the literature. The choice of such a value to replace the unobserved true value that is below LOQ can lead to a different central tendency value. Although in the case PV29, the resultant variation in the central tendency is small and is less likely to bear significant consequence, a consistent and systematic approach is relevant in view of TSCA risk evaluation approach. Looking beyond PV29, it is helpful that EPA develops and adopts a consistent and systematic approach to the situation where samples are below LOQ. In addition to central tendency, it is also useful to report key percentiles (e.g. median, 95-percentile and maximum) based on the two available datasets for the Test Order Study. The use of maximum of the Test Order Study as the high-end estimate should be considered. In view of the high-end estimate, the use of the highest value of total respirable dust concentration does not serve to enhance consistency in EPA's approach to exposure assessment in TSCA risk evaluation. It is difficult to imagine that EPA would always use total dust concentration as the high-end estimate when in fact only exposure to the specific chemical is of relevance.	EPA's use of the average of the LOQ/2 for each operator to generate a central-tendency estimate of exposure is consistent with agency practices given the distribution of the data (U.S. EPA, 1994). In light of the deficiencies in the dataset, particularly regarding the predominance of non-definitive (*i.e.* <LOQ) exposure measurements, EPA determined that this was an appropriate approach. The approach taken by the EPA to estimate central tendency and high-end exposure values will vary depending on the nature of the available data. EPA acknowledges that measurements of total dust in the workplace may not be available for all risk evaluations, but based on the available data for PV29, the EPA determined that these values represented the true high-end exposure estimates for PV29 from a manufacturing setting.

#	Summary of Comments for Specific Issues Related to Charge Question 3	EPA/OPPT Response
1	Two sets of Personal Breathing Zones (PBZ) (Table 2-3, Table 2-5, Table 2-6) were used for calculation of inhalation exposure. The air monitoring experiment should have been conducted with longer sampling durations and higher air flow rates. Because these two actions were not taken, it is likely that concentrations in the air might have been underestimated. The usual EPA method of estimating central tendency and high-end exposures might result in underestimated risk. Can an additional safety factor be built into the calculations? Or can the sampling experiments be performed again with improved methods?	EPA acknowledges these deficiencies and took what it determined to be a conservative approach by considering the highest total dust concentration as representative of a potential exposure to workers. As this measured value may capture not only workplace concentrations of PV29, but also other workplace respirable dusts, and therefore EPA determined that this approach is conservative. As a result, EPA is not taking additional measures to account for potential uncertainties such as adding additional uncertainty factors. Additionally, EPA has calculated both a central tendency and high-end exposure estimation and is incorporating both values in the risk determination.
4	The (two) available data sets are each somewhat limited in scope. EPA is constrained by the data. Heroic interpretation is not warranted. On page 50 of the *Revised Draft Risk Evaluation*, EPA States that "…EPA determined that the study [The E.I. Group, 2020] did not meet the terms of study plan set forth in the Test Order." The text then references a HERO citation that yields a "Content Restricted" message. More discussion of the inadequacies of the study as reported should be included in the *Revised Draft Risk Evaluation* or in an Appendix. Is EPA now satisfied with the response to the Section 4 request?	EPA has bolstered the discussion of the uncertainties and deficiencies identified in the submitted personal breathing zone data as a full review of the dust monitoring study in Appendix I of the final risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 4	EPA/OPPT Response
1	Central tendency and high-end exposure were calculated based upon two air monitoring study data. Three reported median particles from the PSD data sets (0.043, 10.4, and 46.9 μm) and associated estimated deposition fraction in the pulmonary region of the lungs were considered. The estimation follows the typical EPA protocol. I have no additional suggestions over this question.	EPA acknowledges the comment
5	The only other area for consideration is if there is a need to distinguish between solid aerosols and liquid aerosols for PV29. That would be important if there is a potential for reacting with the local respiratory tissues	EPA assumed that exposure of PV29 from solid and liquid aerosols (from spray application of paints containing PV29) are the same as exposure to respirable PV29 dust from manufacturing activities.

#	**Summary of Comments for Specific Issues Related to Charge Question 5**	**EPA/OPPT Response**
1	Carbon black is used as a surrogate for C.I. Pigment Violet 29 (PV29) in the revised draft risk evaluation document. The rationales of choice are 1) the range of carbon black particle sizes (0.014 μm – 0.070 μm) brackets the particle size of PV29 (0.08 μm at 90 percentile), 2) both have similar physical and chemical properties such as density ((1.97 g/cm^3 for carbon black vs 1.69 g/cm^3 for PV29) and insolubility, 3) both have limited absorption and metabolism, and 4) both are being used as pigments and inks. Collectively, the use of carbon black as a surrogate chemical is a scientifically sound decision. The use of the study by Elder *et al.* (2005) is appropriate as multiple species, exposure concentrations and lung overload were assessed.	Carbon black is an appropriate analogue for PV29 due to the similar organic conjugated aromatic ring structure and its poor solubility in water to replicate the lung overload PK phenomenon in inhalation studies. Carbon black has two reliable inhalation studies for risk assessment purposes, the sub-chronic Elder et al., (2005) study and the chronic Nikula et al., study (1995).
2	I concur with EPA's assessment that carbon black is an appropriate surrogate based on its physical- chemical properties and functional use. I had briefly considered suggesting other	EPA acknowledges the reviewer comment

#	Summary of Comments for Specific Issues Related to Charge Question 5	EPA/OPPT Response
	Violet pigments, however upon investigating their physical-chemical properties, the carbon black comparison was still more appropriate, outside of the similarity of the functional groups. The other violet pigments have similar functional groups to PV29, which could inform toxicity, however they are more likely to be readily absorbed due to much higher solubility.	
4	EPA's justification for using carbon black rather than barium sulfate as a surrogate for PV29 appears well founded to this reviewer.	EPA acknowledges the reviewer comment.

#	Summary of Comments for Specific Issues Related to Charge Question 6	EPA/OPPT Response
1	The criteria of surrogate choice are well described and justified in the revised document (page 21 and page 67). No additional information is needed.	EPA acknowledges the reviewer comment.
2	EPA should place further consideration of the potential for carcinogenicity by a non-genotoxic mechanism. Carbon Black is a Group 2B (possibly carcinogenic to human beings) compound according to IARC (2006). The mechanism through which carbon black is suspected to cause tumors is non-genotoxic and is instead thought to be through impaired lung clearance (overloading) and most likely induction of inflammatory reactions, increased reactive oxygen species, and ultimately tumor formation. As carbon black is the preferred surrogate for CI Pigment Violet 29 (PV29), due to its similar critical properties, this too should be considered. Both PV29 and carbon black are poorly soluble and both are negative in genotoxicity assays, likely due to the low solubility (ECHA 2020). Both are considered to cause their toxic effects through lung overload. Thus, if carbon black is acceptable for use in the estimation of chronic exposure and lung overloading, the potential of a	The chronic Nikula et al., (1995) carbon black study cited in the IARC document reported fibrosis and tumors. The relevance of particle overload to humans, and even to species other than laboratory rats and mice, is not clear. While it likely to be of little relevance for most "real world" ambient exposures of humans, it is of concern in interpreting some long-term experimental exposure data. And it may be of concern to humans occupationally exposed to some particle types (Mohr et al., 1994), since overload may involve all insoluble materials and affect all species if the particles are deposited at a sufficient rate (Pritchard, 1989), *i.e.*, if the deposition rate exceeds the clearance rate. In addition, the relevance to humans is also clouded by the suggestion that macrophage-mediated clearance is normally slower

#	Summary of Comments for Specific Issues Related to Charge Question 6	EPA/OPPT Response
	carcinogenetic effect due to this overloading should not be ignored.	and perhaps less important in humans than in rats (Morrow, 1994) and that there will be significant differences in macrophage loading between the two species. The inherent toxicity of the compounds should be considered as well and there are no chronic oral or inhalation studies available for PV29. EPA calculated the HEC values for both the Elder et al., (2005) sub-chronic and Nikula et al., (1995) chronic inhalation studies. In comparison, the Elder et al., (2005) study female rat NOAEC HEC is 0.28 mg/m^3 or 8 times lower than the Nikula et al., (1995) female rat LOAEC HEC of 2.23 mg/m^3. The Elder et al., (2005) study LOAEC HEC in female rats is a similar value of 1.95 mg/m^3. Lung cancer hazard is not anticipated at concentrations in which chronic active inflammation and cell proliferation are not present. Thus, tumor formation by carbon black is not expected at the rat NOAEC HEC value of 0.28 mg/m^3, a concentration that does not cause inflammation and hyperplasia precursor events in animal models. EPA asserts that there is insufficient information for PV29 to classify it as a carcinogen. EPA has added a discussion to the hazard characterization and uncertainty section (Section 3.2.3.2 of the final risk evaluation) concerning potential carcinogenic effects of the carbon black analogue. Tumors were not observed in the Elder et al. (2005) study of carbon black used to identify the POD. Additional characterization has been added to the risk evaluation on this topic and as well as the Nikula (1995) study discussion in Section 3.2.3 of the final risk evaluation regarding the findings of fibrosis and tumors as a result of chronic exposure to carbon black.

#	Summary of Comments for Specific Issues Related to Charge Question 6	EPA/OPPT Response
	Aspect ratio of the particles is critical. The measured "particle size" maxima in BASF data represents only axial 3 lengths (imine to imine) of the PV29 molecule. Different light scattering instruments can be configured to measure particle aspect ratios. The brand use by BASF for their particle counting is one of them. Carbon black normally has an amorphous shape so it is unlikely that carbon black will have a high aspect ratio, while it is quite possible for PV29. High aspect ratios of PV29 particles relative to carbon black would make carbon black an inadequate surrogate.	Compound aspect ratios at the molecular level are not relevant to the aspect ratio of particles which can be ground to any size. In addition, the discussion of particle size as it relates to exposure has been updated in the final assessment. The assumption that different particle sizes will result in different deposition percentages in the lungs has been updated.
5	Carbon black can exist at the elemental level as well as a compound of several carbon atoms, which is very different from the PV29 molecule. The differences in the particle size between PV29 and CB may be due to the tendency of CB particles to form agglomerates. It is important to compare the chemical reactivity potential for both the target and the surrogate analog. The presence of potentially reactive functional groups in PV29 and their absence in CB structure needs to be addressed. This informs the potential for local respiratory effects that would be observed much earlier than the increased bioburden in the lung due to accumulating insoluble particles. At the nanoscale, PV29 and CB are very different substances with non-comparable Physico-chemical properties. Given the structural complexity of PV29, it is acknowledged that finding a suitable surrogate is difficult (if not impossible). Therefore, it would be helpful to highlight these differences and add justification as to why these may or may not be important in the current assessment.	The appropriateness of carbon black as an analogue for PV29 is discussed in greater detail in Sections 3.2.3 of the final risk evaluation. Both PV29 and carbon black are respirable, poorly soluble pigments composed of conjugated aromatic rings that are expected to cause similar PK effect of increased lung burden and adverse effects on the respiratory tract. There are similarities between the two compounds in terms of physical chemical properties that led the EPA to consider this a suitable analogue. The uncertainties of this approach are discussed in Section 4.2.4 of the risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 7	EPA/OPPT Response
4	[The preface to Question 7 includes the statement: *"Dust particles less than 100 µm are considered non- respirable."* This statement is incorrect and may confuse members of the public. It should be corrected when responses are compiled.] The absence of data in downstream facilities is a significant shortcoming. If downstream operations are relatively small economic enterprises, occupational hygiene may be substandard. In the absence of air sampling data and worker exposure factors specific to downstream facilities, EPA is justified in assuming downstream exposures are the same as production facility exposures.	EPA did not include this statement on dust particles in the final risk evaluation.

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
1	The three median particle sizes vary significantly. The highest and the lowest have a difference of 1,079 folds. No values of ONU without a respirator are below the benchmark MOEs. On the other hand, some values of workers without a respirator or workers with APF 10 are below the benchmark MOEs. These differences originate from three median particle sizes of large variations. There is no way to reduce the high uncertainty in the risk characterization, unless more accurate PSD data is collected. Page 79, Line 13-14, Section 3.2.3.2 presents the MOEs for cancer effects. Page 50: the first row of Table 2-6 was duplicated in page 50. It should be removed.	EPA has updated the discussion of inhalation risks from PV29. The EPA recommends reviewers consult the updated discussion of inhalation risks to workers that does not incorporate assumptions of deposition based on particle size (see Section 4.2.1). In addition, the errors indicated by the reviewer have been updated in the final risk evaluation.
4	As noted above, a 46.9 µm median particle diameter (and even a 10.4 µm median) is inherently inconsistent with OSHA 0600 Respirable Particle data. Given two other potential sources of information (Sun Chemical #2 and BASF SDS 4081884) that	EPA has updated the discussion of inhalation risks from PV29. EPA agrees that workers in a manufacturing facility will be exposed to respirable dust. Particle sizes below 10 µm are considered

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
	suggest much finer particles and that larger particles are less likely to be suspended, EPA would be justified in rejecting/discarding the 46.9 µm data point. ONUs cannot be distinguished from OUs by guesswork. In the absence of ONU specific data, use of OU data as a surrogate is justifiable. The regulated community can prevent imposition of excessively conservative ONU exposure assumptions by collecting data.	respirable in humans and are likely the main component of the personal breathing zone data provided to the EPA in response to the Section 4 Test Order. In the final risk evaluation, the EPA is removing the discussion of particle size as it relates to the modeled deposition in the lungs. As a result, it is expected that all respirable particles will be deposited in the lungs and the particle size data received for PV29 will be used primarily to determine whether carbon black is an appropriate analogue to characterize the inhalation hazards of PV29. The updated discussion of inhalation risks from exposures reflects this change in approach and can be found in Table 2.6 of Section 2.3.1 of the final risk evaluation. In the absence of available data to describe risks to ONUs, EPA made assumptions using reasonably available data. While there are uncertainties in this approach, EPA believes that this represents a fair and conservative approach to describe exposure to ONUs in the absence of available data.
6	EPA's "matrix" (or grid) approach of using medium particle size of (0.043 um, 10.4 um, and 46.9 um) is reasonable. A more probabilistic alternative would be to pull the three PSD datasets from BASF and Sun Chemical together and determine the overall median, mean, quartiles, higher percentiles such as 95 and 99 percentiles, and calculate the corresponding MOEs. By doing so, there would be a distribution of MOEs which in turn inform uncertainty and variability in a way that is more quantitative and probabilistic, which in turn supports risk characterization.	EPA has updated the discussion of inhalation risks from PV29. The EPA recommends reviewers consult the updated discussion of inhalation risks to workers that does not incorporate assumptions of deposition based on particle size (see Section 4.2.1 of the final risk evaluation).EPA agrees that workers in a manufacturing facility will be exposed to respirable dust. Particle sizes below 10 µm are considered respirable in humans and are likely the main component of the personal breathing zone data provided to the EPA in response to the Section 4 Test

#	Summary of Comments for Specific Issues Related to Charge Question 8	EPA/OPPT Response
		Order. In the final risk evaluation, the EPA is removing the discussion of particle size as it relates to the modeled deposition in the lungs. As a result, it is expected that all respirable particles will be deposited in the lungs and the particle size data received for PV29 will be used primarily to determine whether carbon black is an appropriate analogue to characterize the inhalation hazards of PV29. The updated discussion of inhalation risks from exposures reflects this change in approach and can be found in Section 2.3.1 of the final risk evaluation.

#	Other SACC Comments not included in the Charge Questions	EPA/OPPT Response
	The nuances of comments made in response to question clearly indicate why careful attention is needed by the agency and in SACC reviews of these TSCA mandated Risk Evaluations. EPA has allocated an insufficient number of staff to review details in supporting documents and those who assigned to this National Need are overstretched. Timelines that the SACC has been given for these reviews are inadequate for such detailed reviews. This situation has compounded itself during the early rounds of TSCA reviews. The situation also clearly highlights the need for full peer review of TSCA mandated Risk Evaluations at critical stages to allow refinement of assessments by improving modeling approaches and data quality for those models. It is positive to note that Figure 1-1 depicts all environmental media to be “in scope” for this evaluation.	EPA acknowledges the efforts of the letter peer reviewers to provide a thorough review on such a short timeline. The difficulties encountered by the letter peer reviewers in light of the abbreviated timeline will be incorporated into the future review schedules of the documents. In this case, the decision to do a letter peer review resulted from the significant changes in the document as a result of the original peer reviewer recommendations, new information, and new agency analysis by EPA. The final letter peer review report can be found in the docket at the following link: https://www.regulations.gov/document?D=EPA-HQ-OPPT-2018-0604-0107

#	Other SACC Comments not included in the Charge Questions	EPA/OPPT Response
	This is a major improvement relative to other TSCA related Risk Evaluations that EPA recently presented to the SACC.	
	No environmental data are presented to justify the omission of all environmental media from consideration as shown in Figure 1-4. No measurements are provided in waste waters or in air exhausts. Thus, Figure 1-4 and the premise of the assessment are in question.	EPA acknowledges the uncertainties resulting from a lack of empirical monitoring studies to measure actual PV29 concentrations in discharges from the manufacturing facility. EPA disagrees that no data are available to assess the potential releases to aquatic and terrestrial media. As indicated in the final risk evaluation, EPA has determined that it has sufficient information to conclude that releases and resulting exposure to aquatic media to PV29 are negligible. Section 2.2 of the final risk evaluation outlines the release information EPA has used to reach this conclusion. To summarize, available discharge information received from the primary US manufacturer indicates that 0.8 lb/day of PV29 is being discharged to wastewater.
	Data screening that removes 96% of available data requires more justification. Return to page 37 and access citation for Systemic review.	EPA would like to clarify the results of the data search process. 96% of the references identified during the data search and screening process were found not to contain relevant information pertaining to PV29. Therefore, it is inaccurate to conclude that 96% of available data were removed, as these data sources did not contain any information relevant to PV29. As a result, 100% of reasonably available data were considered in the assessment, with the exception of the acute inhalation toxicity studies which were determined to be unacceptable following data quality evaluation.
	Page 23 Table 1-3: It is troubling to have 5 yr old production data in an assessment of this magnitude. Also, it is noted that the production is increasing and that imports are improperly excluded from this table. The data should be more current, and the import should be added to the production to develop a table of total use. This type of table	EPA has used the most recent production volume data that was reasonably available and has noted that, although PV29 is being imported, data on import volume was not identified and therefore no information on import volume was included

#	Other SACC Comments not included in the Charge Questions	EPA/OPPT Response
	could have rows for production, import, and total, or it could simply provide a total.	
	Table 2.1. The footnote a must say ESTIMATED unless otherwise noted. Four values are estimated, one is not determined, and one is measured. Careful review of the foot notes in this table is needed. None of the studies in Appendix D are accessible in the Hero Data Base and as such cannot be assessed. The inaccessibility of these data makes it impossible to ascertain the validity of these data. Further the data purport to be testing but based on BASF data the limit value would be well above solubility. It would be useful to use the dissolution approach mentioned in my physical properties comments (Q1) and repeat these studies at or near the solubility. Adding the sulfuric acid solution would not pose a problem as the toxicity tests are likely to be performed in moderately hard water which is buffered and contains sulfate. The sulfate amounts in the test system salts could be altered to accommodate the sulfate from sulfuric acid if needed. Likewise, hydroxide could be added to balance the equivalents of proton from the acid.	EPA has updated the footnote at the suggestion of the reviewer. The EPA has made the studies in Appendix D available in the docket for PV29 (numbered as studies 18, 19, and 20): https://beta.regulations.gov/docket/EPA-HQ-OPPT-2018-0604/document The acute ecotoxicity testing submitted for PV29 were found to be acceptable for use in risk assessment. Given the low solubility of the compound, the approach of dissolving the substance in sulfuric acid, as proposed by the reviewer, would exceed the reported solubility as reported in the solubility testing and would therefore not be representative of actual environmental concentrations expected to result from discharges of PV29 to wastewater.
	In Section 2.2, EPA makes an erroneous assumption that there is extremely limited potential for releases from chemical reactions in the manufacture of other pigments. No data describe reaction efficiencies, reaction byproducts, or product purification effluents are presented. Without such data, this statement cannot be validated.	As shown in the supplemental file, the reaction efficiency from the use of PV29 as an intermediate is >99%, so the potential for release of PV29 is low. The potential for release of other chemicals created as a result of these reactions are outside of the scope of this risk evaluation.
	Section 3.1, Page 64: The solubility of 670 mg/L is higher than measured by others, but the other ecotox studies did	While it is accurate to describe the 0.003 mg/L “solubility limit” as a method quantification limit, The EPA has

#	Other SACC Comments not included in the Charge Questions	EPA/OPPT Response
	measure 6-7 µg/L in test solutions. That should be added to this section and the 0.003 mg/L "solubility limit" should be removed. That is not a solubility limit; it is not a method quantification limit; it is an instrument limit of quantification. If reference to a solubility limit is retained the more appropriate 0.004 mg/L estimate of instrument LOQ should be used, as noted above. Given the sensitive coastal and estuarine ecosystems near the production facility on the Cooper River, important estuarine species should have been tested. Section 4: EPA has too little data to support the statement of low hazard to environmental receptors. Section 5.5.2: The inadequate data sets assembled for the environmental assessment is a common theme in the vast majority of EPA's TCSA Risk Determinations, thus far.	determined 0.003 mg/L to be the limit of solubility because of the nature of the study where it was determined. This study was conducted specifically to measure the limit of solubility of the chemical. The study details included in the ecotoxicity testing regarding the solubility limits are helpful, but these studies did not contain sufficient details to verify the methods for determining the solubility limit. EPA used all reasonably available data to characterize the environmental hazards of PV29. These data were determined to be sufficient to characterize the environmental hazards of the chemical substance.
3	Section 5.3: EPA should be praised for gathering the new information about particle sizes to refine the human health risk assessment. This type of refinement is needed whether it the inclusion produces a risk determination that is suggests more risk or less risk. The refinement increases the certainty that a proper determination has been made.	EPA acknowledges the comment.
	P. 44 LL5 weight should be omitted from the phrase …mean weight diameter of particles… P. 55 there is a font shift just above section 2.3.1.6.	EPA has updated the final risk evaluation to correct the errors indicated by the reviewer.

Cited References

Ankley, GT; Benoit, DA; Hoke, RA; Leonard, EN; West, CW; Phipps, GL; Mattson, VR; Anderson, LA. (1993). Development and evaluation of test methods for benthic invertebrates and sediments: Effects of flow rate and feeding on water quality and exposure conditions. Arch Environ Contam Toxicol 25: 12-19.

BASF. (1988). Testing the acute toxicity in the fish model Zebra danio (brachydanio rerio) over the course of 96 hours. Germany: Hoechst AG, Pharma Research Toxicology and Pathology.

BASF. (2012). H-28548: Paliogen violet 5011, Daphnia magna, acute immobilization test. Pszczyna, Poland: Institute of Industrial Organic Chemistry, Branch Pszcyna Department of Ecotoxicology.

Cherrie, JW; Semple, S; Christopher, Y; Saleem, A; Hughson, GW; Philips, A. (2006). How important is inadvertent ingestion of hazardous substances at work? Ann Occup Hyg 50: 693-704.

Elder, A; Gelein, R; Finkelstein, JN; Driscoll, KE; Harkema, J; Oberdorster, G. (2005). Effects of subchronically inhaled carbon black in three species I Retention kinetics, lung inflammation, and histopathology. Toxicol Sci 88: 614-629. http://dx.doi.org/10.1093/toxsci/kfi327.

Hofmann, T; Ma-Hock, L; Strauss, V; Treumann, S; Rey Moreno, M; Neubauer, N; Wohlleben, W; Gröters, S; Wiench, K; Veith, U; Teubner, W; van Ravenzwaay, B; Landsiedel, R. (2016). Comparative short-term inhalation toxicity of five organic diketopyrrolopyrrole pigments and two inorganic iron-oxide-based pigments. Inhal Toxicol 28: 1-17. http://dx.doi.org/10.1080/08958378.2016.1200698.

ILSI. (2000). The relevance of the rat lung response to particle overload for human risk assessment: A workshop consensus report [Review]. Inhal Toxicol 12: 1-17. http://dx.doi.org/10.1080/08958370050164833.

Mackay, D; Di Guardo, A; Paterson, S; Cowan, CE. (1996). Evaluating the environmental fate of a variety of types of chemicals using the EQC model. Environ Toxicol Chem 15: 1627-1637.

Mohr, U; Dungworth, DL; Mauderly, JL; Oberdorster, Ge. (1994). Toxic and carcinogenic effects of solid particles in the respiratory tract. In U Mohr; DL Dungworth; JL Mauderly; G Oberdorster (Eds.). Washington, DC: ILSI Press.

Morrow, PE. (1994). Mechanisms and significance of "particle overload". In U Mohr (Ed.), (pp. 17-25). Washington, DC: ILSI Press.

Nicolaou, C. (2020). Determination of the Solubility of C.I. PV29 in 1-Octanol and Water. Colors Technology Analytical Laboratory. https://beta.regulations.gov/document/EPA-HQ-OPPT-2020-0070-0008.

Nikula, KJ; Snipes, MB; Barr, EB; Griffith, WC; Henderson, RF; Mauderly, JL. (1995). Comparative pulmonary toxicities and carcinogenicities of chronically inhaled diesel exhaust and carbon black in F344 rats. Toxicol Sci 25: 80-94. http://dx.doi.org/10.1006/faat.1995.1042.

Oberdörster, G; Elder, A; Rinderknecht, A. (2009). Nanoparticles and the brain: Cause for concern? [Review]. J Nanosci Nanotechnol 9: 4996-5007. http://dx.doi.org/10.1166/jnn.2009.GR02.

OPPT EPA. (2010). TSCA new chemicals program (NCP) chemical categories [EPA Report]. Washington, D.C.: U.S. Environmental Protection Agency. http://www.epa.gov/oppt/newchems/pubs/npcchemicalcategories.pdf.

OSHA. (2014). Section II: Chapter 2: Surface contaminants, skin exposure, biological monitoring and other analyses. Washington, DC: U.S. Department of Labor, Occupational Safety and Health Administration. https://www.osha.gov/dts/osta/otm/otm_ii/otm_ii_2.html.

Pritchard, JN. (1989). Dust overloading causes impairment of pulmonary clearance: evidence from rats and humans. Exp Toxicol Pathol 37: 39-42.

Stark, D; Treumann, S; van Ravenzwaay, B. (2013). Reproduction/developmental toxicity screening test in Wistar rats oral administration (gavage). (80R0223/11C162). Germany: BASF SE.

U.S. EPA. (2002). A review of the reference dose and reference concentration processes. (EPA/630/P-02/002F). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. https://www.epa.gov/sites/production/files/2014-12/documents/rfd-final.pdf.

U.S. EPA. (2005). Guidelines for carcinogen risk assessment [EPA Report]. (EPA/630/P-03/001B). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. https://www.epa.gov/sites/production/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf.

U.S. EPA. (2017). Scope of the risk evaluation for Pigment Violet 29 (Anthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetrone): CASRN: 81-33-4 [EPA Report]. (740-R1-7011). U.S. EPA, Office of Chemical Safety and Pollution Prevention, Office of Pollution Prevention and Toxics. https://www.epa.gov/sites/production/files/2017-06/documents/pv29_scope_06-22-17.pdf.

U.S. EPA. (2018a). Application of systematic review in TSCA risk evaluations. (740-P1-8001). Washington, DC: U.S. Environmental Protection Agency, Office of Chemical Safety and Pollution Prevention. https://www.epa.gov/sites/production/files/2018-06/documents/final_application_of_sr_in_tsca_05-31-18.pdf.

U.S. EPA. (2018b). Draft Risk Evaluation for C.I. Pigment Violet 29..

U.S. EPA. (2019). U.S. EPA Integrated Science Assessment for particulate matter [EPA Report]. (EPA/600/R-19/188). https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=347534.

U.S. EPA. (2020a). Final Risk Evaluation for C.I. Pigment Violet 29, Supplemental File: Information Received from Manufacturing Stakeholders.

U.S. EPA. (2020b). Final Risk Evaluation for C.I. Pigment Violet 29, Systematic Review Supplemental File: Data Quality Evaluation of Environmental Fate and Transport Studies.

U.S. EPA. (2020c). Final Risk Evaluation for C.I. Pigment Violet 29, Systematic Review Supplemental File: Data Quality Evaluation of Physical-Chemical Property Studies.