



Federal Court of Australia
District Registry: New South Wales
Division: General

No: NSD1908/2016

GAVIN SMITH and others named in the schedule
Applicant

DEPARTMENT OF DEFENCE and another named in the schedule
Respondent

ORDER

JUDGE: JUSTICE LEE

DATE OF ORDER: 11 July 2019

WHERE MADE: Sydney

THE COURT ORDERS THAT:

Chemistry Joint Expert Conference

1. The list of questions to be provided to Professor Jennifer Field and Professor Ian Cousins to be addressed in their Chemistry joint expert conference, the subject of Orders made on 6 June 2019 are those set out in Schedule A to this Order.

Date that entry is stamped: 11 July 2019


Registrar



SCHEDULE A

QUESTIONS FOR JOINT CHEMISTRY CONFERENCE

DEFINITIONS

In these questions the following definitions apply:

AACO means Army Aviation Centre Oakey

AFFF means aspirated aqueous film forming foam.

AFFF Concentrate means liquid solution which when combined with pressurised water forms AFFF.

DoD means Department of Defence.

Relevant Period means the period between 1976 to 2011

Relevant PFAS means perfluorooctane sulfonate (**PFOS**), perfluorooctanoic acid (**PFOA**) and perfluorohexane sulfonate (**PFHxS**).

Reports means:

1. the report of Professor Jennifer Field filed in *Hudson v Commonwealth* NSD1155/2017 (**Hudson proceeding**) on 31 August 2018;
2. the report of Professor Jennifer Field filed in *Bartlett v Commonwealth* NSD1388/2018 (**Bartlett proceeding**) on 20 December 2018;
3. the report of Professor Ian Cousins filed in the Hudson proceeding and in *Smith v Commonwealth* NSD1908/2016 (**Smith proceeding**) on 18 March 2019; and
4. the report of Professor Ian Cousins filed in the Bartlett proceeding on 21 June 2019.

Spent AFFF means AFFF following discharge.

INSTRUCTIONS

In accordance with orders 1 to 3 of the Orders made on 6 June 2019, at the joint expert conference (and with the assistance of the Facilitator), provide a joint report to the Court by 30 August 2019. In providing the joint report, please observe the following:



- a) To the extent possible, please give your answers in plain English and in as concise a form as practicable.
- b) Do not incorporate your earlier Reports by reference: where this would otherwise be necessary please duplicate the material from the earlier Reports, in summary form, that is relevant in the Joint Report (noting, if necessary, the extent to which it is agreed by both experts or otherwise). You may cross-refer to other sections of your Joint Report where convenient (for example, where the substance of the answer to a question has already been set out elsewhere in the Joint Report).
- c) If one or both of you consider that answering a particular question would be outside the scope of the field of expertise of one or both of you, please identify and explain that in your response to the question.
- d) You must each exercise your independent judgment in relation to the Joint Report. You must each, to the extent consistent with the exercise of your own independent judgment, endeavour to reach agreement with each other on any issue in dispute between you, and failing agreement, endeavour to identify and clarify, with precision, the basis of disagreement on the issues which are in dispute.

QUESTIONS

Terminology

1. What is a 'surfactant'?
2. What is a 'fluorosurfactant'?
3. What is a 'fluorochemical'?
4. What is a per- or poly-fluoroalkyl substance ('PFAS'?)
5. What is a 'per- and poly-fluorinated compound chemical substance' (PFC)?
6. What is a 'contaminant'?
7. What is a 'pollutant'?

Properties of Relevant PFAS



In responding to the questions in this and the following sections, please set out your definition of the scientific community as it relates to the matters you have been asked to address in this report. If you are unable to agree, please answer the following questions by reference to both your own, and the other's understanding of the 'scientific community'.

Solubility

8. To what extent (if any) are each of the Relevant PFAS soluble in water?
9. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the solubility of each of the Relevant PFAS in water developed or changed during the Relevant Period.

Mobility

10. To what extent (if any) is each of the Relevant PFAS mobile in soil, water and the environment generally?
11. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the mobility of each of the Relevant PFAS in soil, water and the environment generally developed or changed during the Relevant Period.

Sorption

12. To what extent (if any) do each of the Relevant PFAS sorb to soil?
13. To the extent that it is within your field of expertise, what is the applicable soil/sediment organic carbon-water partition coefficient (or range of applicable coefficients) for each of the Relevant PFAS at RAAF Base Williamtown, AACO and RAAF Base Tindal?

Degradation and biodegradation

14. To what extent (if any) do each of the Relevant PFAS degrade under environmental conditions?
15. By reference to key dates, please explain how the state of knowledge in the scientific



community in relation to the degradation of each of the Relevant PFAS under environmental conditions developed or changed during the Relevant Period.

16. To what extent (if any) do each of the Relevant PFAS biodegrade?
17. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the biodegradation of each of the Relevant PFAS under environmental conditions developed or changed during the Relevant Period.

Persistence

18. To what extent (if any) do each of the Relevant PFAS persist in soil and water?
19. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the persistence of each of the Relevant PFAS in soil and water developed or changed during the Relevant Period.

Bioaccumulation

20. What are the definitions of bioconcentration, biomagnification, and bioaccumulation?
21. What is the appropriate method / what are the appropriate criteria for classifying a chemical as bioaccumulative? Has the method / have the criteria preferred by the scientific community changed during the Relevant Period?
22. To what extent (if any) do each of the Relevant PFAS biomagnify?
23. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the propensity for each of the Relevant PFAS to biomagnify developed or changed during the Relevant Period.
24. To what extent (if any) are each of the Relevant PFAS bioaccumulative?
25. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to the propensity for each of the Relevant PFAS to bioaccumulate developed or changed during the Relevant Period.



Properties of AFFF

26. What is the chemical composition of AFFF, AFFF Concentrate and Spent AFFF?
27. Are or were any of the Relevant PFAS contained, as ingredients or degradation products, in AFFF, AFFF Concentrate and Spent AFFF?
28. If so, have the changes in formulation of AFFF Concentrate over time altered the Relevant PFAS contained in AFFF, AFFF Concentrate and Spent AFFF? If so, please describe in what way.
29. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to whether AFFF, AFFF Concentrate and Spent AFFF contained the Relevant PFAS developed or changed during the Relevant Period.
30. To what extent (if any) does AFFF deplete oxygen in aquatic environments?
31. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to whether AFFF depletes oxygen in aquatic environments developed or changed during the Relevant Period.
32. What is the impact (if any) of the dilution of AFFF on its oxygen depleting effect in aquatic environments?

Analytical methods

33. Please explain how the technologies available to the scientific community for the detection and measurement of each of the Relevant PFAS in:
 - a. the environment (including water), and
 - b. AFFF Concentrate,
 - c. Spent AFFF;
 - d. developed or changed during the Relevant Period, including whether or not they were reliable.



Human and animal absorption of Relevant PFAS (pathways)

34. To what extent are the Relevant PFAS absorbed by humans, animals, and plants, including (without limitation) by humans and animals:
 - a. drinking water containing the Relevant PFAS,
 - b. consuming produce from land and/or water containing the Relevant PFAS,
 - c. consuming meat from animals that have grazed on land and/or consumed water or produce which contains the Relevant PFAS,
 - d. inhaling dust containing Relevant PFAS, and
 - e. having dermal contact with the Relevant PFAS?
35. In answering question 35 above, please identify the relative significance of each of the exposure pathways identified in response to question 35 (in quantitative terms), to the extent that you are able to do so without reference to particular geographical areas.
36. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to each of the exposure pathways identified in response to question 35 developed or changed during the Relevant Period. If the state of knowledge developed or changed during the Relevant Period, please describe these developments or changes, including when they occurred.

Human absorption of Relevant PFAS (pathways) at Oakey

37. Please provide your opinion as to the pathways of PFC exposure (both direct and indirect), if any, to those properties in the area described as ‘the Investigation Area’ in the Statement of Claim filed on 13 July 2017 in the Hudson proceeding.
38. Please analyse the gaps, limitations or flaws (if any) in the pathways of exposure to the environment, animals and humans identified in the reports prepared for DoD in relation to AACO that you have been provided.
39. If you identify any gaps, limitations or flaws in the methodology and/or data in the



reports prepared for DoD in relation to the AACO that you have been provided, please also analyse the effect, if any, of the gaps, limitations or flaws in the methodology and/or data in the reports prepared for DoD on the results and/or conclusions in those reports, and detail same in your Joint Report.

Human absorption of Relevant PFAS (pathways) at Katherine

40. Please provide your opinion as to the pathways of PFC exposure (both direct and indirect), if any, to those properties in the area described as ‘the Relevant Area’ in the Statement of Claim filed on 7 August 2018 in the Bartlett proceeding.
41. Please analyse the gaps, limitations or flaws (if any) in the pathways of exposure to the environment, animals and humans identified in the reports prepared for DoD in relation to RAAF Base Tindal that you have been provided.
42. If you identify any gaps, limitations or flaws in the methodology and/or data in the reports prepared for DoD in relation to RAAF Base Tindal that you have been provided, please also analyse the effect, if any, of the gaps, limitations or flaws in the methodology and/or data in the reports prepared for DoD on the results and/or conclusions in those reports, and detail same in your Joint Report.

Migration of Relevant PFAS

43. How do the Relevant PFAS behave when contained or in contact with concrete structures?
44. By reference to key dates, please explain how the state of knowledge in the scientific community in relation to how the Relevant PFAS behave when contained or in contact with concrete structures developed or changed during the Relevant Period.

Articles referred to in Smith Proceeding

45. Do the three fire retardants and the two foam suppressants the subject of the 1996 Article referred to in paragraph 25 of the Third Further Amended Statement of Claim in the Smith Proceeding contain PFAS?



46. Are the foam suppression chemicals the subject of the 1996 Article referred to in paragraph 25 of the Third Further Amended Statement of Claim in the Smith Proceeding PFAS?



Schedule B

No: NSD1908/2016

Federal Court of Australia
District Registry: New South Wales
Division: General

Second Applicant	KIM SMITH
Third Applicant	ANN AND LINDSAY CLOUT SMSF PTY LTD ACN 154 516 006
Fourth Applicant	ANN CLOUT
Fifth Applicant	LINDSAY CLOUT
Sixth Applicant	JOHN ARTHUR HEWITT
Eighth Applicant	MARSHALLS TRANSPORT PTY LTD
Ninth Applicant	NICHOLAS MARSHALL
Tenth Applicant	MELISSA MARSHALL
Respondent	COMMONWEALTH OF AUSTRALIA (DEPARTMENT OF DEFENCE)