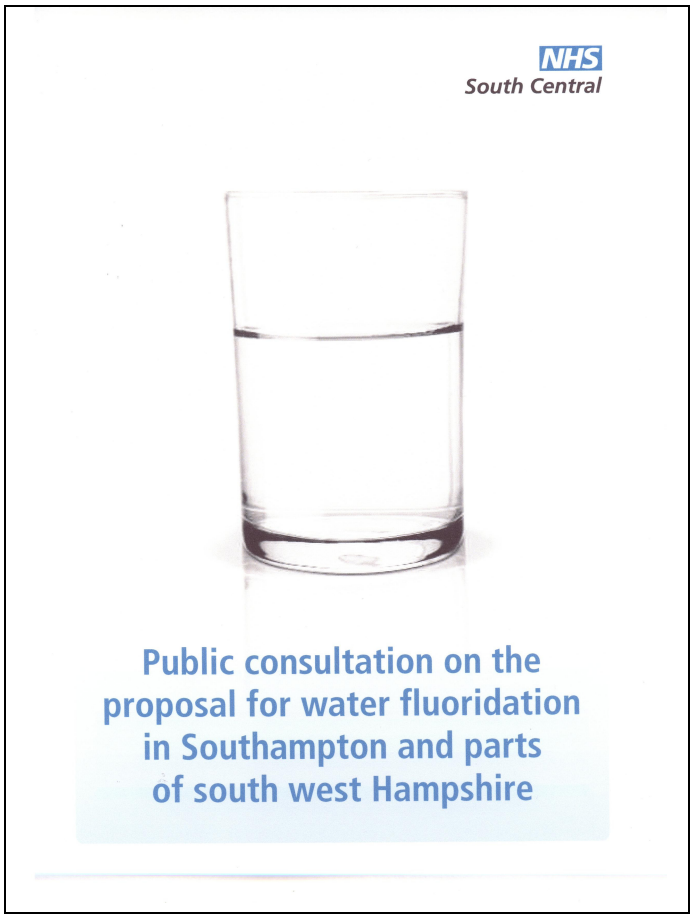
APPENDIX 1

SOUTHAMPTON CITY COUNCIL

HEALTHY CITY SCRUTINY PANEL

REPORT OF THE SCRUTINY INQUIRY INTO SOUTH CENTRAL STRATEGIC HEALTH AUTHORITY'S CONSULTATION ON PROPOSALS FOR WATER FLUORIDATION IN SOUTHAMPTON AND PARTS OF SOUTH WEST HAMPSHIRE

SEPTEMBER – OCTOBER 2008



Members:

Councillor Cooke (Chair)
Councillor Capozolli
Councillor Daunt
Councillor Drake
Councillor Marsh-Jenks
Councillor McEwing
Councillor Osmond

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FOREWORD

I am pleased to be able to submit the Healthy City Scrutiny Panel's inquiry into South Central Strategic Health Authority's public consultation on the proposal for water fluoridation in Southampton and parts of South West Hampshire. The inquiry was commissioned to review the proposals in detail and to formulate recommendations to enable the meeting of the full Council on 19th November 2008 to debate the issues and formulate the authority's response to the consultation.

The Scrutiny Panel was mindful of the fact that despite the amount of information gathered during the course of the inquiry, and the level of knowledge and understanding of the subject gained by the Scrutiny Panel, if it was to assist the other 41 councillors not on the Scrutiny Panel in the debate at the Council meeting in November 2008, this report needed to be concise and readable. Some of my colleagues on the Council may suggest it is still too long. Other readers not on the council who are experts in the subject of water fluoridation will argue that it is too short and that some of the issues they are particularly concerned about are not evaluated in detail, or have been omitted from this report. The Scrutiny Panel has tried to distil the key information into a document that summarises what members saw as the major issues and evidence.

I would like to thank my colleagues on the Scrutiny Panel for the substantial work they put into this inquiry. In addition to attending and making valuable contributions over the course of several lengthy meetings they had to devote time to reading a large number of detailed and technical documents, many of which were submitted as additional documents by witnesses after they had presented evidence and answered questions at the meetings.

I hope this inquiry report assists the members of the Council to formulate a response to the Strategic Health Authority on this very important public health issue.

Councillor Edwina Cooke,
Chair, Healthy City Scrutiny Panel

RECOMMENDATIONS

Recommendation 1

That having considered a wide range of evidence the Council endorses the Strategic Health Authority's proposed scheme to fluoridate the water supply, as set out in its consultation document, as a means of improving dental health and reducing dental health inequalities.

Recommendation 2

That if the scheme to fluoridate the water supply is implemented, Southampton City Primary Care Trust should report formally to the Council on the effect of trends in dental health over the first 5 years' operation.

Recommendation 3

That if the scheme to fluoridate the water supply is not implemented, Southampton City Primary Care Trust be requested to report to the Healthy City Scrutiny Panel on proposals to improve dental health in the city.

INTRODUCTION

1. In September 2008 South Central Strategic Health Authority (SHA) launched a 14 week consultation on proposals to add fluoride to water supplies in Southampton and parts of south west Hampshire to reduce tooth decay and address dental health inequalities. The meeting of the full Council on 19th November 2008 will determine the Council's response to the consultation. To assist the Council, Overview and Scrutiny Management Committee instructed the Healthy City Scrutiny Panel to undertake a scrutiny inquiry to review the SHA's proposals.

2. The Scrutiny Panel held two lengthy evidence sessions. A range of witnesses supporting and opposing the proposals presented evidence. This report analyses the issues raised during the course of the scrutiny inquiry and summarises key issues to assist the debate at full Council.

3. This has been a challenging inquiry to undertake. There are strong, vocal and eloquent supporters in favour of fluoridation in Southampton and against it. The topic of water fluoridation is complex and up to a point the scientific evidence to assess its safety and effectiveness is incomplete. As a consequence the views on both sides of the argument have required the Scrutiny Panel to assimilate substantial amount of scientific information. What the Scrutiny Panel has attempted to achieve is an understanding of the key points from the evidence presented and the major issues that this raises, and relate this to the situation in Southampton.

4. The Scrutiny Panel wishes to record its appreciation to the officers supporting the review and to the witnesses who generously gave their time to prepare and contribute evidence.

TERMS OF REFERENCE AND CONDUCT OF THE INQUIRY

5. The following terms of reference for in the inquiry were assigned by the Overview and Scrutiny Management Committee:

   To analyse the SHA's proposals to fluoridate the water supply to 160,000 residents plus workers in the city, paying particular attention to:-

   - The potential effectiveness of fluoridating the water supply as a means of improving dental health and addressing dental health inequalities;
   - Ethical issues of fluoridating the water supply to the population at large;
   - The wider health concerns raised in respect of the fluoridation of water supplies.

6. The inquiry was conducted over the course of 3 meetings. At the first meeting the state of dental health in the city was discussed, together with the effects of fluoridation on dental health, its role in addressing dental health inequalities, and the ethics of fluoridating water supplies. The second meeting looked in detail at the practicalities of the scheme proposed, including operational safety and running costs, the costs and benefits off the scheme, and an evaluation of alternatives to fluoridating the water supply. The witnesses who contributed evidence are listed in Appendix 1. The third meeting discussed and reviewed the evidence received and agreed the content of this report.

THE SCHEME PROPOSED FOR SOUTHAMPTON

7. The starting point to the current consultation began in May 2005, when Southampton City Primary Care Trust (PCT), using the procedures set out in the Water Act 2003, requested the Hampshire and Isle of Wight SHA (the forerunner body of the current South Central SHA) to consider the feasibility of adding fluoride to the water supply as a means of addressing high levels of tooth decay and dental health inequalities in Southampton. The SHA then commissioned two major pieces of work: Abacus International produced a report assessing the economic implications of fluoridating the water supply, and Atkins undertook a Fluoridation Feasibility Study that examined the water engineering and supply issues. In May 2008, having considered these studies and the practicalities and affordability of adding fluoride to the water supply, the SHA decided it was satisfied that fluoridation represented a feasible option to improve the dental health of the local population.

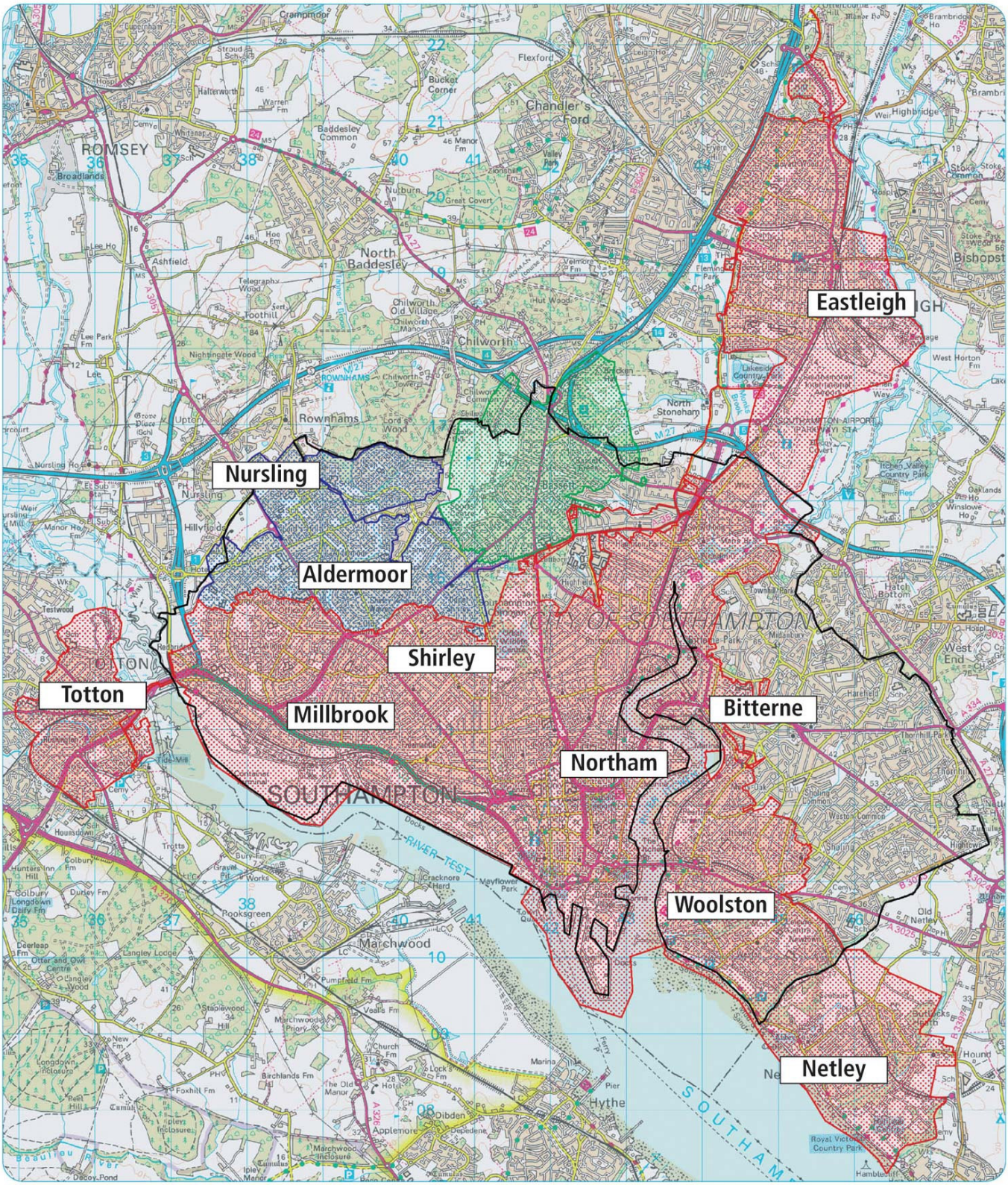
8. The water supply network does not mirror the City Council and PCT boundary. Consequently the scheme the SHA is now consulting on provides for adding additional fluoride to the water supplies for approximately two-thirds of the residents in the city. It excludes approximately one third of the residents living in the east of the city. The supply system means that approximately 35,000 people living outside the city would also have fluoride added to their water supplies. The coverage of the scheme proposed is shown in Figure 1 overleaf. A substantial part of the east of the city, containing 4 of the 11 priority neighbourhoods, is not included in the scheme. Since the consultation began it has become apparent that Southern Water does not consider it practical to fluoridate the water to 23,500 people in the city on the area covered by the Rownhams transfer station and this further reduces the percentage of the population receiving fluoridated water.

9. The amount of fluoride currently in the city's water supply is 0.08 parts per million (ppm). The scheme proposed would increase the concentration to 1ppm. This is in line with the Department of Health Guidance.

10. The SHA has indicated that the capital costs of the scheme would be £471,000, which would be met by the Department of Health from its annual budget for funding water fluoridation projects. The revenue costs of the scheme are estimated to be approximately £59,000 a year. These costs would be met by Southampton City Primary Care Trust (PCT) as part of its dental health budget. No costs would fall on Southampton City Council.

11. The Water Act 2003 empowers SHAs to require water companies to fluoridate water supplies after developing a feasible scheme and consulting with local residents, the relevant local authorities and stakeholders. Taking account of the comments raised in the consultation, the SHA has to satisfy itself that the health arguments in favour of introducing a scheme outweigh all the arguments against. This is what the SHA will do when it makes its final decision in February 2009.

Figure 1
Map outlining the proposed areas in Southampton and south west Hampshire where fluoridation would occur



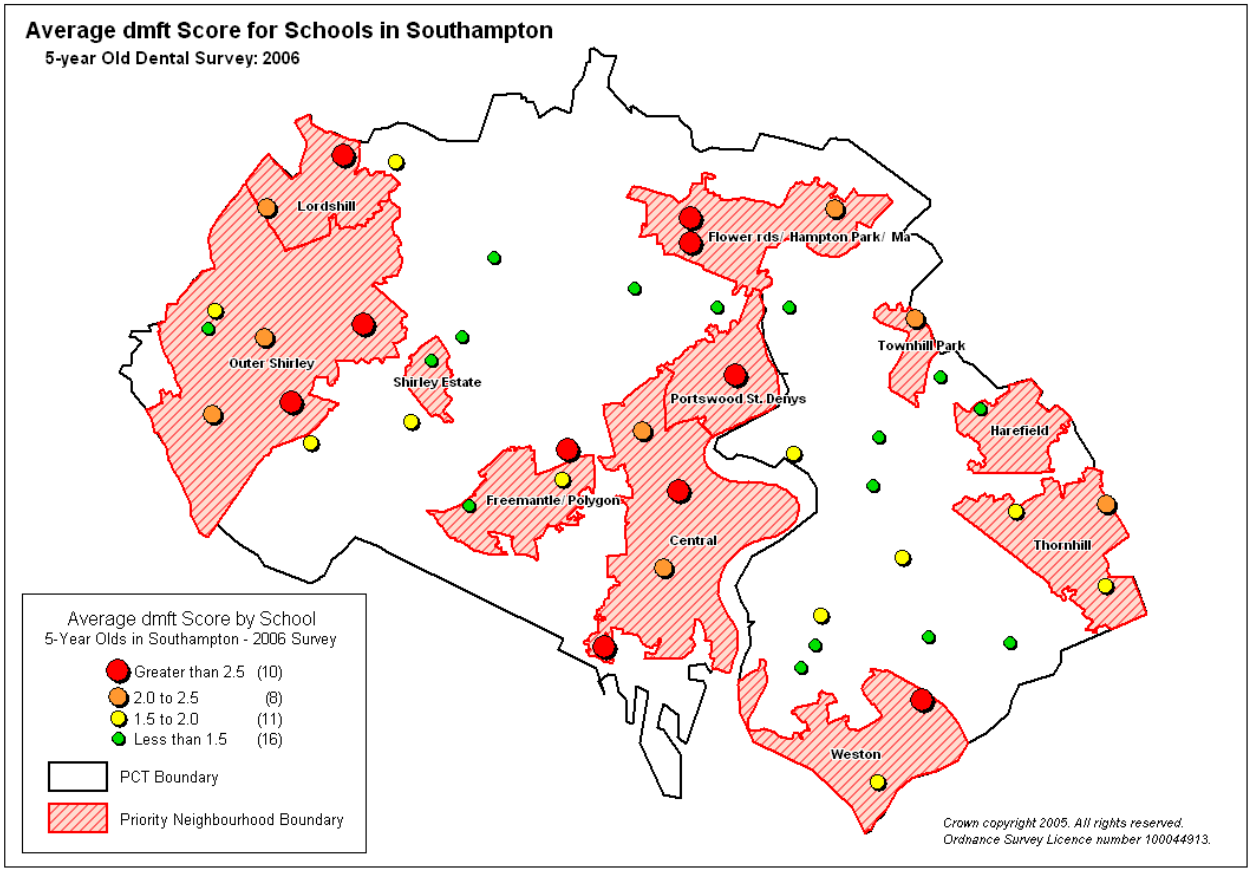
DENTAL HEALTH IN SOUTHAMPTON

12. The driving force behind Southampton City PCT's request to the SHA to evaluate the feasibility of a fluoridation scheme was to improve dental health in the city which, it claims was deteriorating over time and was worse than regional and national averages. The table below summarises the position for 5 year old children.

	2002	2006
At least one decayed, missing or extracted teeth	37%	42%
Average number of teeth decayed, extracted or filled	1.5	1.8

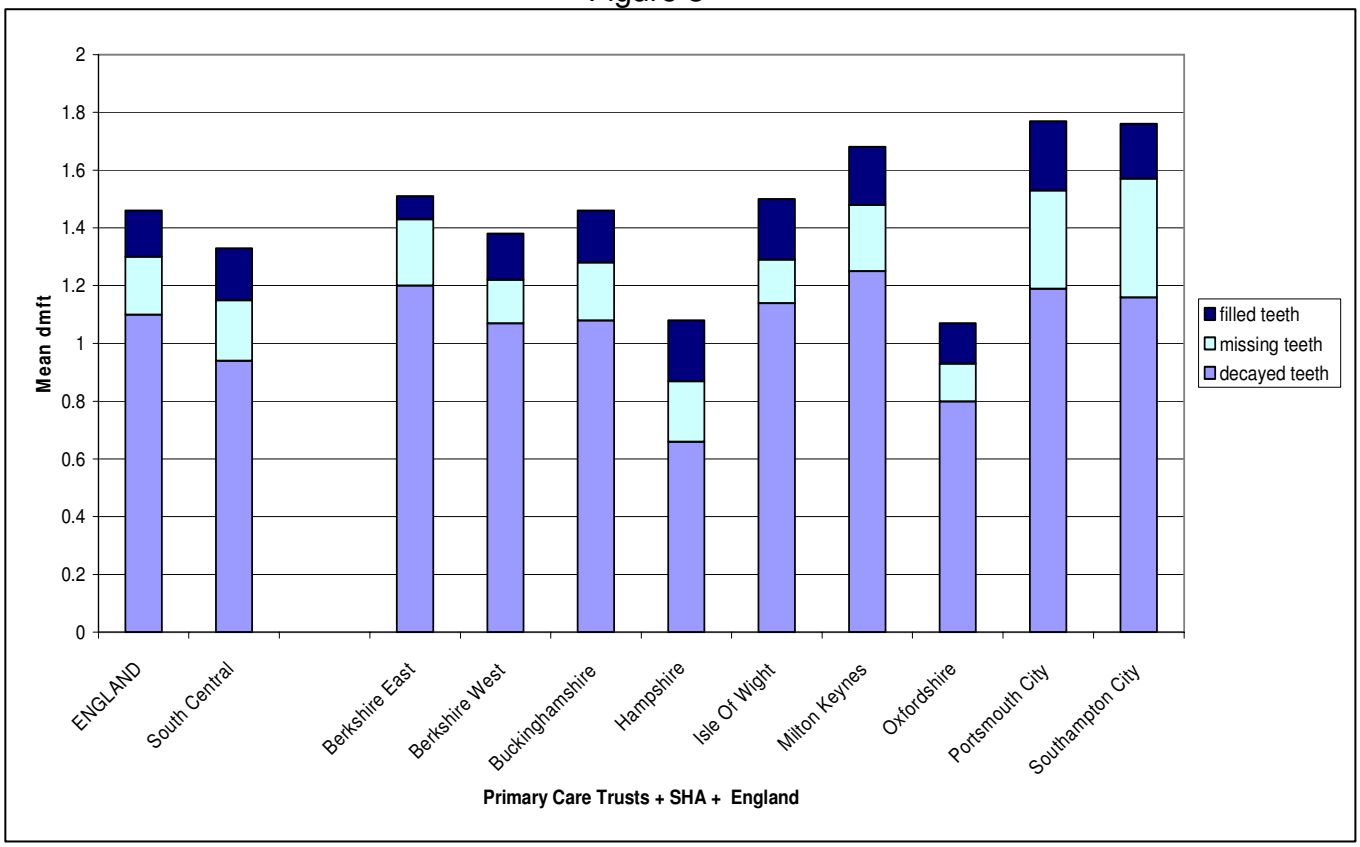
13. A 2006 survey mapped the dmft score (for decayed, missing or filled teeth) for 5 year olds by school (see Figure 2), which showed that the problem was most severe in priority neighbourhoods, where dental decay was 52% more common than the remainder of the city.

Figure 2 – Average dmft Score for Schools in Southampton



14. Figure 3 summarises the regional standing in oral health. It shows that decay rates are above the national average and the average for the South Central SHA area. Whilst broadly at the same level as Portsmouth, the number of missing teeth is higher in Southampton.

Figure 3



WATER FLUORIDATION IN ENGLAND

15. Currently approximately 6 million people in England, approximately 10% of the UK population, receive artificially fluoridated water. The largest concentration is in the West Midlands where 3.6 million people (67% of the population) have fluoride added to the water.

16. Two chemicals are permitted to be used to add fluoride to water supplies:

- Disodium Hexafluorosilicate (powder)
- Hexafluorosilicic Acid (liquid)

17. Water fluoridation is practiced in a number of other countries and over 300 million people drink fluoridated water. Countries which practice water fluoridation include Australia, New Zealand, Ireland, USA and Canada. Some countries have previously permitted water fluoridation, but have subsequently stopped the practice. These include Sweden, Finland, Germany, the Netherlands and Japan.

SCIENTIFIC STUDIES ON THE EFFECTS OF WATER FLUORIDATION

18. Scientific studies, some of varying quality, can be cited to prove almost any point in the debate on water fluoridation. The Chief Medical Officer in the Department of Health commissioned the NHS Centre for Reviews and Dissemination at the University of York to undertake a review of the existing scientific studies. The report on outcomes from the review, lead by Professor Sheldon, was published in 2000, and reached the following conclusions:

- **Effect on the incidence of caries:** "The best evidence available suggests that fluoridation does reduce caries prevalence.... The degree to which caries is reduced is not clear from the data available."
- **Effect of fluoridation over and above alternative interventions and strategies:** "A beneficial effect of water fluoridation was still evident."
- **Reduction of caries across social groups:** "The quality of the evidence ... was low... There was some evidence that water fluoridation reduces the inequalities in dental health across social classes in 5 and 12 year olds, using the dmft/DMFT measure. This effect was not seen in the proportion of caries free children among 5 year olds. The data for the effects in children of other ages did not show an effect."
- **Dental fluorosis:** "Dental fluorosis was the most widely observed and frequently studied of all negative effects... The prevalence of dental fluorosis at a water fluoride level of 1ppm was estimated to be 48% and for fluorosis of aesthetic concern it was predicted to be 12.5%"
- **Bone fractures and bone developmental problems:** "There is no clear association of hip fracture with water fluoridation. The evidence on other fractures is similar. Overall, the findings of studies of bone fracture effects showed small variations around the "no effect" mark."
- **Cancer studies:** "There is no clear association between water fluoridation and overall cancer incidence and mortality. The same was also true for osteosarcoma and bone/joint cancers. Only 2 studies considered thyroid cancer and neither found a statistically significant association with water fluoridation. Overall, no clear association between water fluoridation and incidence of mortality of bone cancers, thyroid cancer or all cancers was found.

19. In 2001 Professor Sheldon published a letter criticising some of the quotations made about the review where he felt supporters of fluoride were suggesting the review proved fluoride to be safe. He wrote, "The review did not show fluoridation to be safe. The quality of the research was too poor to establish with confidence whether or not there are potentially important adverse effects in addition to the high levels of fluorosis. The report recommended that more research was needed."

20. As a consequence of the questions raised in the York review the Department of Health then commissioned the Medical Research Council (MRC) to consider what further research was required to improve knowledge about fluoridation and health. The subsequent report, produced in 2002, sought to identify areas of uncertainty regarding the balance of benefits and risks of water fluoridation, and make recommendations for research to address the uncertainties. The key issues arising from this study were:

- Trends in fluoride exposure, especially in children, need to be tracked.
- No studies have shown fluoridation to increase dental health inequalities.
- There is almost universal agreement that tooth decay in children is related to social class. The majority of the research conducted indicates that fluoridation reduces dental caries inequalities between high and low social groups.
- Further studies are recommended to look at appropriate measures of social inequalities related to water fluoridation, dental caries and fluorosis, taking into account important factors such as the use of fluoridated toothpaste and dietary sugar ingestion.
- More work is warranted on the effects of fluoridation on dental health in adults.
- Evidence suggests no effect on hip fractures, but the possibility of a small percentage change (either an increase or a decrease), cannot be ruled out.
- Available evidence suggests no link between water fluoridation and either cancer in general or any specific cancer type. However, an updated analysis of UK data on fluoridation and cancer rates is recommended.
- There is no evidence for significant health effects on the immune system, reproductive and birth defects and effects on the kidney and gastrointestinal tract, nor from leaching of lead from pipes and aluminium from cooking utensils, although it is appropriate to keep the area under review.

21. In addition to the 2 British studies quoted above, further international analyses have been undertaken in the USA by the National Research Council in 2006, and in Australia by the National Health and Medical Research Council in 2007. Witnesses have extensively quoted results from both of these publications.

22. The United States study, Fluoride in Drinking Water: A Scientific Review of EPA's Standards by the Committee on Fluoride in Drinking Water, was published by the National Research Council. In the USA fluoride concentrations of up to 4ppm had been permitted. It was difficult to relate much of the research quoted to schemes in the UK, most of which are at a concentration of 1ppm.

23. The Australian study concluded:

- The existing body of evidence strongly suggests that water fluoridation is beneficial at reducing dental caries.
- Water fluoridation results in the development of dental fluorosis. However the majority of dental fluorosis is mild and not considered to be of “aesthetic concern”.
- Bassin et al (2006) suggest an increased risk of osteosarcoma amongst young males (but not females) with water fluoridation. However, the co-investigators subsequently published a letter in which they pointed out they had not been able to replicate the findings and urged caution in the interpretation of the study pending further analysis.
- The authors of previous systematic reviews concluded that the studies examining other possible negative effects of water fluoridation provide insufficient evidence to reach a conclusion.

ETHICAL ISSUES OF WATER FLUORIDATION

24. The fact that once introduced into a water supply scheme, users do not have a choice whether to receive it or not, raises a number of ethical issues. The Nuffield Council on Bioethics published a case study on the ethics of the fluoridation of water that usefully analysed the major issues. It analysed the balance between the individual having the right to choose whether or not to have fluoride added to their water supply against the wider benefits that may accrue to dental health if the water supply was fluoridated.

25. The report identifies the following factors as principles that may be used in favour of water fluoridation:

- Reduction of the risks of ill health – The state has a duty to intervene to provide interventions that reduce ill health. The benefits to health have to be weighted against risks or harms. (Paragraph 7.15) Water is already treated in several ways to improve safety (e.g. through the addition of chlorine), and therefore it would be legitimate to alter the quality of drinking water by adding fluoride if it were shown to promote or improve health for the population. (Paragraph 7.16)
- Special care for the health of children – Children are an especially vulnerable group because they are subject to dental caries and are less able to make informed choices about their dental health than adults. They are dependent on parents and carers to assist with preventative measures such as tooth brushing. (Paragraph 7.17) Water fluoridation may be a special case to take action without major infringements on their parents' liberties. (Paragraph 7.18)
- Reducing health inequalities – Public health programmes that address inequalities can, in principle, be ethically justified. This justification could be used for the fluoridation of water given that it may improve dental health across the population, including in lower socio-economic groups. (Paragraph 7.19)

26. The study also suggests that the following principles may be used in justification against water fluoridation:-

- Not intervening without the consent of those affected – It could be argued that the measure is acceptable only if all those receiving fluoridated water individually agree to whatever level of risk there may be, both for themselves and those in their care, especially children. (Paragraph 7.20)
- Minimise interventions that affect important areas of personal life – Although individual consent may not be required, adding fluoride to water could be seen to restrict the choices of individuals in some significant way because individuals are able to exercise little choice over the water they consume. The values people assign may be difference. For some people the main issue could be about having a choice about what to ingest, for others it may relate to a certain conception of health, or water may be considered as something special and unique.(Paragraph 7.21)
- Not coercing ordinary adults to lead healthy lives – It can be acceptable to require members of society to sacrifice some freedom in order to secure benefits for those who cannot make effective choices about their health, but it would not normally be considered acceptable to restrict freedoms in such a way as to force individuals into leading healthy lives. The key question then is whether

fluoridating water is overly coercive given the potential benefits to certain groups within society. (Paragraph 7.22)

27. The case study reached the following conclusions:

- Personal values – The principles of avoiding coercive interventions and minimising interventions in personal life could be used to argue against the addition of any substance to the water supply. However, the addition of potentially beneficial substances should not always be prohibited. The situations in which this may be appropriate should be identified. (Paragraph 7.25) There are considered to be potential benefits in reducing ill health and inequalities, although these currently difficult to quantify. There are also potential harms and there is therefore a need to consider in what sense consent is relevant, as well as the possibility of alternative approaches. (Paragraph 7.26)
- Reducing inequalities – Based on the best evidence available it is not straightforward to conclude that water fluoridation reduces dental health inequalities as measured by outcomes. (Paragraph 7.27) Because water fluoridation is provided directly to everyone it is an intervention that, in principle, provides equal access for all. However, this principle needs to be weighed against other considerations, in particular the potential for harms, and the likelihood and extent of benefits. (Paragraph 7.28)
- Reducing ill health by ensuring environmental conditions that sustain health, and caring for the health of children – An average of the studies included in the York review suggested that water fluoridation may lead to an additional 14.6% of the child population having no caries. (Paragraph 7.30). This has to be balanced against the incidence of fluorosis. (Paragraph 7.32) There is evidence of harm, although there is debate over the extent and the significance of harm. This gives rise to two alternative and opposing applications of the cautionary approach. Firstly because fluoridation raises the possibility of some benefits to health it should be implemented. Alternatively, because fluoridation raises the possibility of some risks to health, perhaps its implementation should be prohibited as a precaution. (Paragraph 7.33)
- Consent – Requirements for individual consent can be especially problematic where there is a very low risk of harm to a person, and where refusal to give consent would prevent others from accessing important benefits. (Paragraph 7.38) The most appropriate way of deciding whether fluoride should be added to water supplies is to rely on democratic decision-making procedures. These should be implemented at a local and regional level because the need for, and perception of, water fluoridation varies in different areas. Account should be taken of relevant evidence, and alternative ways of achieving the intended benefit in the area concerned. Whatever policy is adopted, dental health and any adverse effects of fluoridation should be monitored. (Paragraph 7.41) The acceptability of any policy involving the water supply should be considered in relation to the balance of risks and benefits, the potential of alternatives and, where there are harms, to the roles of consent. (Paragraph 7.49)

- Information – Policy makers and the public need access to clear and accurate information, and the uncertainties and the strengths or weaknesses of the evidence should be explicitly recognised. (Paragraph 7.51)

CONSIDERATION OF EVIDENCE PRESENTED BY WITNESSES

28. In the course of this inquiry over 9 hours of verbal evidence was taken from witnesses. Detailed presentations were made, many of which were subsequently backed up by further written evidence setting out evidence that it had not been possible to cover in the presentations, or which sought to clarify further the issues raised during the course of questioning. The Scrutiny Panel would like to place on record its gratitude to all witnesses for their time and commitment in presenting complex information with a view to informing a lay audience.

29. A central evidence file has been maintained throughout the course of the inquiry. Members of the Scrutiny Panel have had the opportunity to review all of the evidence submitted. It is not possible to summarise all of the evidence presented within the confines of this report. In order to achieve the objective of producing a report to assist the Council to debate its response to the consultation proposals it has been necessary to be selective. The omission of a citation of a particular piece of evidence should not be seen as a rejection of its relevance by the Scrutiny Panel.

30. Copies of all the presentations given at the evidence collecting meetings have been placed in the Members' room. Notes of additional information provided in response to questions are attached at appendices 2 and 3.

31. The report now considers the evidence under the following headings:

- The effects of fluoridating the water on dental health
- Other health issues in relation to fluoridating the water supply
- Costs and benefits of the scheme proposed
- Alternatives to water fluoridation to improve dental health
- The delivery scheme proposed for Southampton

THE EFFECTS OF WATER FLUORIDATION ON DENTAL HEALTH

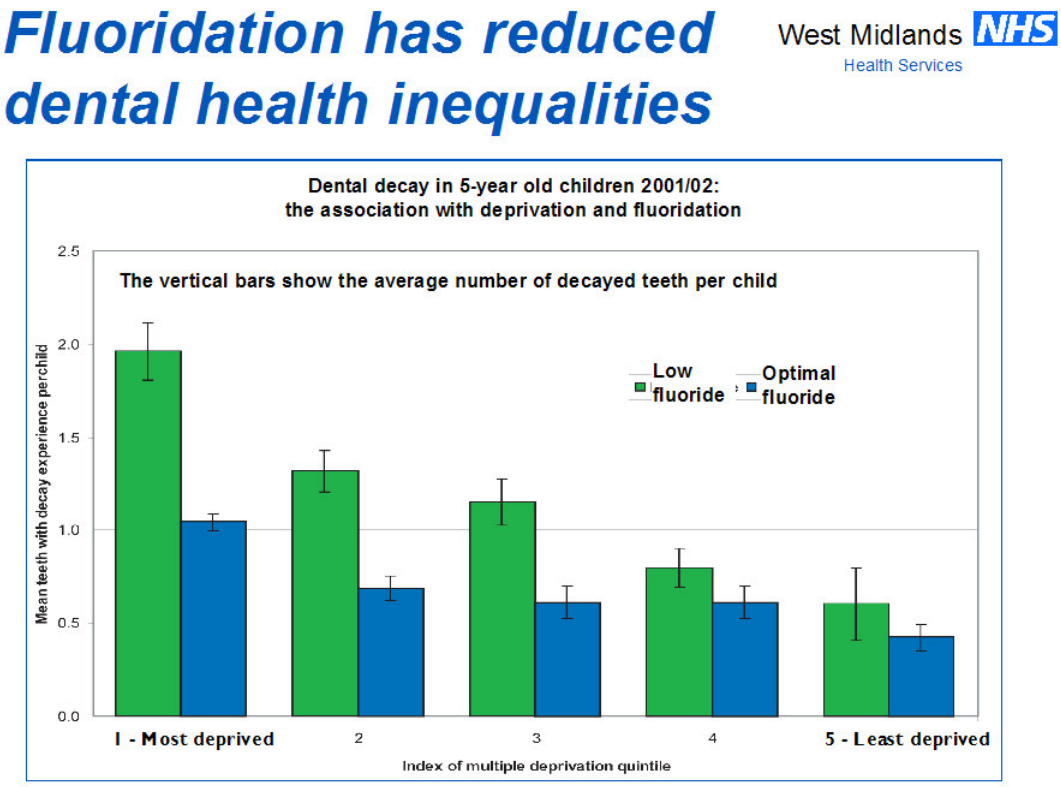
32. The outcomes from the York Review were considered by the Scrutiny Panel during the course of preliminary reading in advance of the inquiry. This introduced the warning of the lack of high quality research. Nevertheless, it did indicate that water fluoridation reduces caries prevalence. The debate was then focussed on the extent to which a reduction might be achieved, and the extent to which it may or may not have a negative impact on dental health, particularly in the form of dental fluorosis. Much of the evidence presented related to the dental health of 5 year old children. When questioned as to why this group was chosen, the response was that it is an internationally accepted benchmark. Opponents of fluoridation stated this was the wrong age to compare as the teeth erupt a year later in fluoridated areas. The PCT did not accept this and stated that teeth erupted at the same stage in fluoridated and non-fluoridated areas.

Evidence in support of the introduction of water fluoridation

33. Water has been fluoridated in parts of Britain for over 40 years. The area with the highest proportion of water fluoridation is the West Midlands, where the first fluoridation scheme was introduced in 1964. Evidence from West Midlands SHA indicates that across the whole SHA region the rate of tooth decay in children is lower than in south east England.

34. Figure 4 suggests that fluoridation is addressing dental health inequalities. The ratio between then number of decayed teeth per child is higher in areas with low fluoride areas than those with fluoride added to the water supply.

Figure 4



35. The dental benefits extend beyond children, and could lead to a reduction in dental decay in adults by 30%. Fluoride can lead to a condition called fluorosis, which affects the enamel on teeth. In most cases this will be mild, and would be white flecks on teeth and would only be noticeable by a dental professional.

36. The use of fluoride at a concentration of 1ppm is supported by a number of organisations and individuals including the World Health Organisation, British Medical Association, British Dental Association and the Chief Dental Officer.

37. Southampton City PCT believe that measurable improvements in dental health will be visible within 5 years of the introduction of the scheme to fluoridate the water supply.

Evidence against the introduction of water fluoridation

38. Evidence presented suggest fluoride is ineffective in improving dental health. Tooth decay in Southampton had improved by a factor of 5. Witnesses indicated that in some fluoridated areas there has been an insignificant reduction in decay, but there has been a major increase in dental fluorosis. They also reported no difference in decay rates between fluoridated areas and non-fluoridated areas for children aged 12.

39. Rates of tooth decay have improved internationally in countries that have chosen not to use fluoride, as well as in countries that fluoridate their water supplies.

ALTERNATIVES TO WATER FLUORIDATION TO IMPROVE DENTAL HEALTH

40. Southampton City PCT outlined a number of oral health promotion initiatives that could be delivered as an alternative to fluoridated water. These include:

- Salt fluoridation
- Milk fluoridation
- Fluoridated toothpaste
- Topical fluoride varnish applications
- Fluoride supplements
- Fluoride mouth rinses

41. Some of these initiatives had already been undertaken and targeted schemes had, for example, led to free toothpaste and toothbrushes being issued as part of the Surestart programmes. There was little reliable data from the UK on the costs and cost effectiveness of preventative interventions.

42. Access to the most vulnerable children was a problem. Application of the topical fluoride varnish applications could be undertaken in schools, but required parental consent. Some previous initiatives had only achieved a 30% consent rate.

43. The PCT believed that targeted initiatives could produce results, but they would not be at the same level as if the water supply was fluoridated. Furthermore, there was a risk that the most needy children would still be denied the protection from tooth decay they needed if they could not obtain parental authorisation.

44. Opponents of water fluoridation stated that high levels of tooth decay in Southampton were not the result of a lack of fluoride, but resulted from a poor diet, high sugar consumption and poor oral hygiene. They cited case studies from Sweden where mass education and treatment programmes had brought about major reductions to tooth decay

OTHER HEALTH ISSUES IN RELATION TO FLUORIDATING THE WATER SUPPLY

45. A major concern in relation to the addition of fluoride to the water supply is to ensure that the monitoring of the effects is not solely on dental health, but that any other impact on health is also assessed.

Evidence Supporting the Safety of Fluoride

46. Evidence from the York review was cited indicating no evidence of associations with increased hip fractures or incidences of cancer. Dr John Langford from the West Midlands SHA indicated that the data collected by the Public Health Observatory had not identified any connections between fluoride in the water and any incidence of disease. The West Midlands SHA had requested its Cancer Registry to undertake additional analysis, and no connections were made between cancer rates and fluoridated water.

47. Written evidence was received from Professor Keith Cox of the School of Biological Sciences at the University of Southampton stating there were "negligible health risks at this concentration". Professor David Phillips of the Epidemiology Resource Centre at the University of Southampton submitted evidence stating, "Contrary to the claims of the anti-fluoridation groups there is no credible evidence of a link between fluoridation and thyroid disease." Professor Cyrus Cooper, Director of the MRC Epidemiology Resource Centre at the University of Southampton Medical School and Southampton General Hospital submitted evidence in which he stated, "I believe that there is no risk of increased bone fractures or cancers in areas where the fluoride in water supplies occurs naturally at a level of one part per million or where a lower amount of natural fluoride in water is topped up to, and maintained at, that level through a fluoridation scheme. It would be extremely regrettable if the potential dental health benefits of fluoridation were to be lost as a result of scare stories about bone fractures, cancers or other alleged problems. Careful analysis of the available scientific evidence lends weight to the Southampton City Primary Care Trust's call for fluoridation to be introduced locally so that current and future generations experience less tooth decay and a reduced need for dental treatment."

Evidence Against the Safety of Fluoride

48. Individuals and organisations opposed to fluoridation put forward the case that there were a number of detrimental effects caused to health by the addition of fluoride to the water supply. They cited the fact that the US National research Council report of 2006 contained reference to studies which claimed fluoride damages bones, the brain, interferes with the endocrine system and may cause osteosarcoma.

49. The health of babies and young children was raised. Evidence was submitted referencing the views of Dr Hardy Limerick from the University of Toronto that "children under three should never use fluoridated toothpaste. Or drink fluoridated water. And baby formula must never be made up using (fluoridated) tap water." Other concerns raised were the fact that babies with formula milk made with fluoridated water could be exposed to fluoride at 250 times the level that occurs in mother milk.

50. Concerns were raised that there was no evidence of the levels of fluoride ingestion in the areas where water was fluoridated, and the amount of fluoride taken into and absorbed by the body would depend on the amount of water drank.

COSTS AND BENEFITS OF THE PROPOSED SCHEME

51. The SHA commissioned independent consultants to undertake an analysis of the economic implications of the scheme. It claims this shows the cost of preventing tooth decay is 32p per tooth. This is based on the estimated 36,032 teeth that are saved from decay over a 20 year period by fluoridated water, and a net additional cost of a water fluoridation scheme of £11,526 over the same 20 year period, which equates to £576.30 a year. These figures assume savings in NHS dental care costs as reductions in caries are generated through greater protection from fluoridated water.

52. If the projected reduction of 25% in caries is not achieved the costs per tooth could rise substantially, as the operating costs would remain the same, but the projected reduction in NHS dental care costs would not be achieved.

53. Opponents of the scheme suggested that the SHA's analysis underestimated the costs, and over-estimated the benefits. The model used by the SHA made no allowance for the treatment of fluorosis or for any other health effects that may be the result of a fluoridated water supply. They also cite evidence that NHS dental costs are no lower in fluoridated areas than non-fluoridated areas, and question why this is if fluoridation is reducing tooth decay.

WATER DELIVERY SCHEME – OPERATIONAL ISSUES

54. The proposed scheme would deliver fluoridated water to approximately 160,000 people in the city. This means that approximately one third of the residents would be excluded.

55. Southern Water provided evidence on the practicalities of delivering a fluoridated water supply in accordance with the plan. Dosing the water with hexafluorosilicic acid would be undertaken at Otterbourne and at Rownhams. However, Southern Water did not believe that dosing within the Rownhams Distribution Zone was a "practical or reasonable" option. If this proved to be the case, then over 26,500 fewer Southampton residents would be covered by the scheme.

56. The SHA's consultants' study estimated the capital cost of the scheme at £471,000. This figure is disputed by Southern Water. The water company believes the installation of the equipment would cost more than this, and the two sides are currently in discussion to resolve the issue. There is no dispute on the operational revenue costs of the scheme. If the capital costs increase, the cost-benefit analysis would need to be re-worked. The additional costs of the scheme would be funded centrally from the Department of Health, and no additional costs would fall on the SHA or Southern Water.

57. Southern Water was questioned on the safety issues related to fluoridating the water supply. The quality of the hexafluorosilicic acid was controlled by European standards and the Water Supply (Water Quality) regulations 2000. The main impurities are phosphate and free hydrogen fluoride, and other potential contaminants are arsenic, chromium, lead and mercury. However, once diluted at 1ppm, all the impurities would be well below the levels permitted in the regulations.

58. All staff responsible for adding the fluoride to the water would have been trained to NVQ Level 2 in Water Treatment, and in addition would have received general health and safety training, site specific training, and fluoride specific training including operational checks and recording and emergency procedures. Dual validation fluoride monitors would be installed providing back-up in the event that one failed, and dosing systems would be linked to telemetry, alarms and an automatic shutdown system would cut in if pre-set limits were exceeded or plant failures were detected.

59. Opponents of water fluoridation presented evidence of the toxicity of haxafluorosilicic acid and dangers of transporting it by road. Evidence was submitted of spillage incidents on the road in the USA, and on a ship in the UK. It was reported that in the USA there are an average of 3 accidents a year involving fluoride chemicals. The impurities were a concern, as there were believed to be associated environmental issues, including the build up of the impurities in soil, crops and animals, and the fact that some of them had been associated with other conditions such as diabetes.

CONCLUSIONS AND RECOMMENDATIONS

60. Having reviewed the evidence presented in detail, the Scrutiny Panel was not able to reach a unanimous conclusion. On a vote, the majority of members supported the proposals to fluoridate the water supply in approximately two thirds of the city, as set out in the SHA consultation document. Members were unanimously of the view that, if implemented, the PCT should monitor trends in tooth decay to measure the effectiveness of the measure. If the scheme was not implemented the Scrutiny Panel would wish to discuss alternative actions available to reduce tooth decay with the PCT.

Recommendations:

61. **Recommendation 1**

That having considered a wide range of evidence the Council endorses the Strategic Health Authority's proposed scheme to fluoridate the water supply, as set out in its consultation document as a means of improving dental health and reducing dental health inequalities.

62. **Recommendation 2**

That if the scheme to fluoridate the water supply is implemented, Southampton City Primary Care Trust should report formally to the Council on the effect of trends in dental health over the first 5 years' operation.

63. **Recommendation 3**

That if the scheme to fluoridate the water supply is not implemented, Southampton City Primary Care Trust be requested to report to the Healthy City Scrutiny Panel on alternative proposals to improve dental health in the city.

Appendix 1

Witnesses Contributing Evidence to the Inquiry

22nd September 2008

Southampton City Council	Dr John Beer, Executive Director of Communities Health and Care
	Clive Webster, Executive Director for Children's Services and Learning
West Midlands Strategic Health Authority	Dr John Langford, Consultant in Dental Public Health
South Central Strategic Health Authority	Dr James Mapstone, Deputy Director of Public Health
Southampton City Primary Care Trust	Dr Andrew Mortimore, Director of Public Health
	Dr Jeyanthi John, Consultant in Dental Public Health
UK Councils Against Fluoridation	Dr Paul McCormack
	Dr John Lees
Hampshire Against Fluoridation	John Spottiswoode, Chairman
Safe Water Information Service	
National Pure Water Association	Elizabeth McDonagh
British Dental Association	Richard Clifford
	Dr Phillip Gowers

13th October 2008

Southern Water plc	Dr Nigel Smetham, Head of Water Quality and Regulatory Assurance
	Joanne Statton, Company Solicitor
	Trevor Clark, Regional Water Supply Manager
South Central Strategic Health Authority	Dr James Mapstone, Deputy Director of Public Health
	Sandra White, Consultant in Dental Public Health
	Kevin McNamara, Head of Communications
Hampshire Against Fluoridation	John Spottiswoode, Chairman
	Dr Stephen Peckham
National Pure Water Association	Elizabeth McDonagh, Chairman
	John Graham, Vice-Chairman
Southampton City Primary Care Trust	Dr Jeyanthi John, Consultant in Dental Public Health

Appendix 2

Healthy City Scrutiny Panel
22nd September, 2008

Summary of Responses to Questions

These notes are a summary, not a transcript, of the responses given to questions asked by members of the Scrutiny Panel. Information provided to the meeting in slide presentations has been placed on file in each of the members' rooms.

John Beer, Executive Director of Communities, Health and Care

- As Executive Director has a duty to promote health and well-being.
- Filling teeth and extractions are avoidable, and if not avoided affect health.
- We would want all parents to ensure their children brush with fluoride toothpaste twice a day. But they do not and the council lacks the resources to ensure this is done.
- We know that a certain level of fluoride in the water supply can significantly reduce fillings and extractions.
- Some places have this naturally, others add it to the water supply and millions of people worldwide benefit in this way.
- Where fluoride occurs naturally efforts are not made to reduce it because it is seen as good rather than bad for health.
- We already add chemicals to the water supply to make it safe and to other foodstuffs so they can promote good health.
- It cannot be against the law to add fluoride, as the law expressly allows this to happen, subject to consultation.
- Southampton is in the forefront, and this will be a very exposed position for the Scrutiny Panel.
- The Scrutiny Panel will get "scientific" evidence to support both sides of the debate, and it will be a big challenge to separate good science from bad science.
- Hopes the Scrutiny Panel will use the extensive scrutiny inquiry will enable members to make the right decision in relation to the health and well-being of the citizens of Southampton.

Dr John Langford
West Midlands SHA

- Cancer registry looked independently at incidences of bone cancer and found no evidence of increase in fluoridated areas.
- There is a low background level of mild fluorosis in the West Midlands. Fluorosis is not a major dental health issue.
- During experience of practicing dentistry in schools it was possible to identify children living in areas with fluoridated water because of their better dental health.
- Increased expenditure in dental health in Wolverhampton in past years was the consequence of funding following the location of dental surgeries, rather than significant changes in local dental health.
- Made no statement that the views of those who oppose the addition of fluoride support bad science. Opponents are not always equipped to understand scientific documents, and may express opinions without a full understanding.
- The York Review was critical of the quality of evidence available. Much of the evidence has been collected over a long period of time. In some earlier studies the methodology was not as good as in later studies.
- The Australian government review of fluoridation raised no significant concerns over its use.
- Monitoring and research in the West Midlands had generated evidence that journals had not wanted to publish because it did not show an effect between fluoride and health issues.
- The Drinking Water Inspectorate set an upper limit for fluoride in the water of 1.5ppm.
- No health or medical problems identified as a consequence of 45 years of water fluoridation in the West Midlands.

Dr James Mapstone
South Central SHA

- SHA has been reliant on evidence from large population studies.
- MRC findings have been examined.
- Each concern raised in public consultation exercises is being followed up.
- Some responses received to date have challenged whether the consultation process is real.
- Telephone survey to be used later in the consultation process.
- University of Birmingham will be preparing a report to SHA Board analysing responses to consultation.
- Legal advice had been taken to check that all processes followed are lawful.
- First "Question Time" event at St Mary's Stadium on 20th October to be recorded and made available on SHA website.
- It is important that the consultation process identifies what the community wants.
- Not yet hearing the voice of the community in consultation events. First two have only generated 30 – 50 responses each.
- The public appears to be confused as to whether or not the existing water supply is fluoridated.
- In EU, 4 countries fluoridate their water supply.

Dr Jeyanthi John
Southampton City PCT

- Dental health in Southampton is declining inside and outside priority neighbourhoods.
- There are risks giving children who have to have extractions general anaesthetics.
- Individuals do not get fluorosis once the tooth enamel has set.
- In the US lawyers drink fluoridated water, and are not taking action against water companies.
- Measuring dental health of 5 year olds is an internationally accepted benchmark.
- Fluoridated water consumed through cooking or boiling for beverages is beneficial to dental health.
- No evidence to suggest increase in bone fractures.
- No evidence of 12 month delayed eruption of children's teeth when drinking fluoridated water.
- MRC qualified evidence from the York Review.
- PCT is looking to facilitate support to SHA consultation and is using postcards, leaflets and other publications to support this. Publications point to sources of more information.
- Young children using fluoridated toothpaste need to be supervised because if swallowed it has higher concentration of fluoride than drinking water.
- No dangers identified with feeding compound milk to babies make with fluoridated water. Recent Australian study identified very low rates of fluorosis.
- No evidence of damage to unborn children showing through in statistic from West Midlands.

Dr Andrew Mortimore
Director of Public Health

- PCT request to SHA to assess feasibility of fluoridating water supply not made on a whim.
- Fluoridation schemes have not been more widely adopted because to do so it has to be supported by communities and not all communities have supported it.
- Prior to the Water Act 2003 it was difficult for new schemes to be adopted.
- Improvements to dental health should be seen within 5 years of introducing fluoridated water.
- There are issues associated with poor parenting skill, and the fluoridation proposals reflect the situation that currently exists in the city. In an ideal world fluoridation may not be the preferred option, but it is appropriate to the prevailing circumstances in Southampton.
- The message to people concerned about have fluoride added to their water supplies would be to look at the evidence from areas where it occurs naturally near 1ppm or has had fluoride brought up to this level.
- No evidence of children who would benefit from drinking fluoridated water refusing to drink it and being denied benefits in other fluoridated areas.

Dr Paul McCormack, Dr John Lees
UK Councils Against Fluoridation

- There are 4 important questions to answer:
    - Why do the vast majority of countries not fluoridate their water supplies?
    - Why have most EU countries rejected it?
    - Why has the government given immunities to water companies in the Water Act 2000?
    - Why are those supporting water fluoridation paid to do so and those against it are unpaid for doing so?
- Lawyers will be looking for evidence of fluorosis if a fluoridation scheme is introduced.
- Medical risks could include physical and psychological damage, people with kidney and liver disease being at risk, as well as people weakened by systemic diseases, calcium deficiencies, thyroid deficiencies, and anxiety.
- MRC said no firm evidence on some diseases being related to fluoridate, but there was a need to update statistical analysis.
- MRC acknowledges research base is incomplete and more needs to be done.
- Nuffield report indicated evidence base for fluoridation was not strong
- York Review indicated lack of adequate research and low quality of much of existing research.
- Dangers of monitoring intake of fluoride and risks of overdosing.
- Dangers of accident at water supply plant.
- The policy is a gamble and not evidence based.
- Risk of putting policy before evidence.
- Fluoridating water supply is compulsory mass medication.
- Fluoridation pays no attention to the health needs of the individual.
- Chemicals used to fluoridate water supply have never been licensed by medicine approval bodies.

- Half of the fluoride ingested through drinking fluoridated water will remain in a person's bones for the rest of their life.
- Fluoride is an ingested poison.
- Aquafresh toothpaste made for the American market contains a message to keep it out of the reach of children under 6 years of age and to contact a doctor if consumed.
- Mouthwash can be produced without any indication of its fluoride content.
- Fluoride in dental floss.
- Fluoride can be present in denture toothpaste – why?
- Fluoride is in pesticide residues and can be present at 2ppm in some Californian wine.
- Dentists have access to toothpaste with 5000ppm fluoride that can only be issued with a prescription.
- Fluoride enters rivers in fluoridated areas.
- It is present in tea, Teflon and Prozac.
- There are picture of effects of fluoride in water from Ireland that UK authorities do not want us to see.
- Fluorosis creates dental equalities that don't exist at the moment.
- We need mass education, not mass medication.
- Why should most children suffer because of some feckless parents?

- If teeth have to be re-veneered the dental enamel has to be removed down to the dentyne.
- York Review said evidence based studies showing fluoride stays in bones are poor quality, but they are available via the internet. More research is not being undertaken at the present time.
- Water companies demanded an indemnity from government – they have taken legal advice and they are very concerned.
- A lot of people want to take cases to court but withdrawal of legal aid has made this difficult.
- No known court cases for medical effects in UK.
- No win, no fee cases are difficult to take because of problems in isolating the effect of fluoride from other factors.
- Fluoride is poisonous. It has a specific affinity for calcium. It can't be got into teeth without it getting into bones as well.
- Would be very surprised if there were not big claims for fluorosis and medical conditions associated with fluoridated water in the next 10 years.

John Spottiswoode
Hampshire Against Fluoridation
Safe Water Information Service

- There is a lot of gossip and misinformation on the subject.
- Much of what you've been told is wrong.
- The benefits claimed don't exist.
- Danger of fluoride as a gas and a liquid. Valuable to steel and aluminium production and in production of atom bomb.
- In 1963 US firms invested $2.7bn selling fluoridation to the UK.
- Used PR companies to prove it was safe by adding it to drinking water and toothpaste.

- There is not proof of the risks, but always a suspicion.
- The difference in dental health between Southampton and Sandwell is only very small in real terms.
- There are no improvements in dental health for adults if water is fluoridated.
- Changes in adult dental health are the consequence of socio-economic effects.
- US NRC found negative effects of fluoride at less that 4ppm.
- No testing done for fluoride poisoning in humans in areas with fluoridated water.
- Believed to be an accident relating to too much fluoride added to the water at supply plant in Vermont, but no details available.
- China and India trying to remove fluoride from water.
- York Review was constrained by only being able to look at fluoride in water.
- Fluoridated salt not supported as it can create affect people with thyroid problems.

Elizabeth McDonagh
National Pure Water Association

- A study of the periodic table indicates halogens react with elements of the opposite side of the table.
- The York Review had its hands tied by the restrictive terms of reference set by the government. No major research since then looking at concentrations of fluoride up to 1ppm.
- The difference in tooth decay between children in Portsmouth and Southampton is ¼ tooth per child.
- The difference in tooth decay between children in Southampton and Portsmouth is ¾ tooth per child.
- In Southampton some schools buck the trend and show lower rates of tooth decay. Work is needed to identify why this is. Schools doing badly need to be targeted for action.
- Hartlepool has highest fluoridation levels in England at 1.5ppm. There is very limited margin for safety at 0.5ppm between the upper permitted limit and that proposed for Southampton.
- The levels of fluoride in India that create chronic conditions shown on slides are 4-12ppm.
- US NRC research into 4ppm raised a number of concerns and this was high quality science.
- In the US the Environment Protection Agency reduced permissible fluoridation rates to 2ppm. The level between what is seen as healthy in US and UK is very close, but people also get fluoride from other sources.
- The less fluoride ingested the better. Witness tried to avoid tea.

Dr Phillip Gowers, Richard Clifford
British Dental Association

- Fluoridated water reduces tooth decay across all age groups.
- An Irish study of adults aged 35-45 showed 35% more healthy teeth in fluoridated areas.
- Child dental health is better in areas with fluoridated water.
- 1ppm is defined as a safe level of fluoridation under the Water Act 2003.
- This concentration is acknowledged as safe by the World Health Organisation in 1994, and confirmed in 1996 and again in 2004.
- Since 2006 dentists have been required to record any incident of fluorosis at the conclusion of an examination.
- Incidents of fluorosis are usually in a mild form, and the occurrence should be seen in the context of improved dental health for the population at large.
- Fluorosis is treatable on the NHS. The treatment is not as drastic for the patient as having to fill teeth.
- If tooth decay was reduced by the introduction of fluoridated water, dentists would have resources to turn to other dental health needs. Curing tooth decay would not put them out of work.
- Can count the number of dentists opposed to fluoridating water supplies on the fingers of one hand.

Appendix 3

HEALTHY CITY SCRUTINY PANEL – 13TH OCTOBER 2008
FLUORIDATION INQUIRY

Summary of Responses to Questions

These notes are a summary ,not a transcript, of the responses given to questions asked by members of the Scrutiny Panel. Information provided to the meeting in slide presentations has been placed on file in each of the members' rooms.

Proposed Scheme for Fluoridating Southampton's Water Supplies

Southern Water

- Concerns at dosing at Rownhams. Not reasonable or practical. Concerns over costs.
- Established code of practice to follow for overdosing.
- Containment arrangements would exist for spillages on-site.
- Dual validation systems would be installed to monitor fluoride doses. This reduces risk of errors occurring.
- On delivering of fluoride supply an operator checks the load in the tank correspondents to the projected supply.
- Dosing points are locked off and secure.
- Small number of occasions when incidents have occurred at water supply works have resulted in Southern Water have to make reports to the Drinking Water Inspectorate.
- Other chemicals are added to the water. These include chlorine, alum sulphate, phosphates and caustic soda. The purpose of these is to maintain water quality.
- Regulations require the treatment of water, and prevent the supply of untreated water.
- Changes to water pressure would not create problems if fluoride was added to the water supply.

Strategic Health Authority

- 26,000 people would be supplied from Rownhams.
- Further discussions are needed with Southern Water about the feasibility of dosing at Rownhams. This would not take place while the current consultation was underway.
- Talked to Department of Health about costs of other schemes.
- No dispute with Southern Water on revenue costs.
- The area of disagreement is in respect capital costs. If they are higher than cited in the consultation document, they will still be met in full from the DoH £40m national budget for fluoridation projects.

Hampshire Against Fluoridation

- Average of 3 accidents per year in USA
- Avonmouth port closed in 1990 because of leakage from a vessel
- Road spill accident has occurred in Florida.
- Trace amounts of arsenic have been linked to incidents of diabetes.
- Accidents have been linked to mechanical and human error.
- The chemicals are very corrosive and can cause leaks.

National Pure Water Association

- Fluoridating the water supply constitutes an assault and battery on customers.

Costs and Benefits of the Proposed Fluoridation Scheme

Sandra White, South Central SHA

- The issue of delivering savings from the reduction in tooth decay is complicated. Dentists contracts mean this cannot be achieved without negotiation.
- Costs are a relatively minor issue. The programme is more about prevention than cost. Fluoridation can benefit the whole population.

Hampshire Against Fluoridation

- A lot of the material put out is propaganda.
- In a population of 200,000, 4% fluorosis would affect 8,000 people and cost £3,000 per treatment.
- Other areas with low spends on dental health include Hampshire, The Isle of Wight, Avon/Gloucestershire/Worcestershire, Thames Valley, Kent & Medway, Surrey, and Sussex.
- Unfluoridated Kent & Medway have some of the best dental health in the country.

National Pure Water Association

- Water fluoridation is not cost-neutral. It causes brain damage which can result in an IQ deficit. This can result in fewer bright children. The costs of these consequences can fall on the Council.

Evaluation of Alternatives to Fluoridating the Water Supply to Improve Dental Health

Dr Jeyanthi John – Southampton City PCT

- The evidence base for assessing the effectiveness of alternatives is poor.
- Dietary interventions have been tried, but were unsuccessful.
- We know fluoride works. Fluoride toothpaste improves dental health and is freely available to buy.
- DoH has funded Brushing for Life schemes in Southampton. Toothbrush and toothpaste renewals 2 – 4 times a year.

- Topical fluoride varnish – applied 2 – 4 times a year, but can't get high proportion of children to see a dentist.
- Positive authorisation required before children can be treated.
- Authorisation rates down to under 30% in some schools.
- Produced a package circulated to 20 schools to support teachers to give advice on brushing and diets.
- Targeted work would continue and be intensified in the non-fluoridated areas.
- Not supporting fluoride in salt, because promotion of salt is against other public health messages being given out.
- Incidence of fluorosis has not been monitored nationally.
- The next national survey of 12 year olds will pick up on perception of markings on teeth. If there has been a problem caused by fluoride this survey should identify it.

Hampshire Against Fluoride

- High levels of dental fluorosis occur in poor areas of community. It seems fluoride gets into the teeth more in some poorer areas.
- The Glasgow community dental health scheme halved rates of tooth decay.

National Pure Water Association

- USA, Canada and Australia all failed to show overall benefits from fluoridated water. The known benefits are negligible.
- Experiment in Sweden to control streptocarpus mutans in first time mothers. Worst 25% offered thorough dental treatment including mechanical cleaning. Idea was to stop infection being passed to children.
- Challenge PCT figures on fluorosis. A register has been kept of cases. Applications made for legal aid to take a case, but turned down.

Strategic Health Authority Process for Evaluating Consultation Responses

- Consultation papers circulated to GP Practices and libraries.
- Response good to date.
- Average of 50 people at each drop in event.
- Can't exclude the comments of any councils.
- When the decision is made, the information to back it up will be placed in the public domain.
- Decision meeting will take place in Southampton in February.
- SHA looking for assistance in locating a suitable venue.